Volume II

# CORRECTIVE ACTION IMPLEMENTATION
## Building 207/231 AREA
Presidio San Francisco, California

# TECHNICAL SPECIFICATIONS AND CONSTRUCTION DRAWINGS

October 23, 2008

*Prepared for:*

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*Prepared by:*

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MACTEC Project No. 4084075106-07

# DOCUMENT 00007

# SEALS

## PART 1 GENERAL

## 1.01 PROFESSIONAL SEALS

A. This set of Construction Documents (Technical Specifications and Construction Drawings) was prepared by MACTEC Engineering and Consulting, Inc. (MACTEC).

B. Engineer:

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**END OF SECTION**

# SECTION 00102

# LIST OF DRAWINGS AND ATTACHMENTS

## PART 1 GENERAL

### 1.01 SUMMARY

A. This document lists the drawings for the project.

### 1.02 CONTRACT DRAWINGS

A. Contract drawings are as follows:

| SHEET NO. | SHEET REF. NO. | TITLE |
|---|---|---|
| 1. | G-001 | Title Sheet |
| 2. | G-002 | Notes, Legend and Abbreviations |
| 3. | C-101 | Site Plan – North Area |
| 4. | C-102 | Site Plan – South Area |
| 5. | C-103 | Temporary Controls Plan |
| 6. | C-104 | Previous Soil and Groundwater Analytical Results – North Area |
| 7. | C-105 | Previous Soil and Groundwater Analytical Results – South Area |
| 8. | C-106 | Demolition Plan – North Area |
| 9. | C-107 | Demolition Plan – South Area |
| 10. | C-108 | Gas Utility Plan – South Area |
| 11. | C-109 | Water and Gas Utility Plan – North Area |
| 12. | C-110 | Pre Construction Water Utility Plan – South Area |
| 13. | C-111 | Building 230 Excavation Water Utility Plan – South Area |
| 14. | C-112 | Building 231 Excavation Water Utility Plan – North Area |
| 15. | C-113 | Storm Drain Utility Plan – North Area |
| 16. | C-114 | Storm Drain Utility Plan – South Area |
| 17. | C-115 | Electrical and Communication Utility Plan – North Area |
| 18. | C-116 | Electrical and Communication Utility Plan – South Area |
| 19. | C-117 | Sanitary Sewer Utility Plan – South Area |
| 20. | C-118 | Sanitary Sewer Realignment Plan and Profile – South Area |
| 21. | C-119 | Excavation Plan – North Area |
| 22. | C-120 | Excavation Plan – South Area |
| 23. | C-121 | Restoration Plan |
| 24. | C-122 | Gorgas Avenue – Plan and Profile |

| | | |
|---|---|---|
| 25. | C-301 | Cross Sections |
| 26. | C-401 | Transportation Plan |
| 27. | C-402 | Truck Haul Routes Plan |
| 28. | C-501 | Sections and Details |
| 29. | C-502 | Sections and Details |
| 30. | C-503 | Sections and Details |
| 31. | C-504 | Sections and Details |
| 32. | C-505 | Sections and Details |
| 33 | C-506 | Sections and Details |

## 1.03 ATTACHMENTS

Attachment 1 - Geoarchaeological trench logs (*MACTEC, 2006b*)
- A-1: TRENCH 38TP100 & 38TP101
- A-2: TRENCH 207TP100 & 207TP101
- A-3: TRENCH 230TP100
- A-4: TRENCH 231TP100 & 231TP101
- A-5: TRENCH 231TP102 & 231TP103

Attachment 2 – Natural Sand Specifications

Attachment 3 – Presidio Trust's Sanitary Sewer Management Plan

## PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

Not used.

## PART 4 MEASUREMENT AND PAYMENT

Not used.

**END OF SECTION**

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## TECHNICAL SPECIFICATIONS

## DIVISION 1 – GENERAL REQUIREMENTS



## DIVISION 2 – SITE WORK

**DIVISION 3 - CONCRETE**



**DIVISION 13 – SPECIAL CONSTRUCTION**

# SECTION 00101

# BID SCHEDULE

## PART 1 GENERAL

1.01 BASIS OF BIDS

A. Bid Form

Bidder must complete Bid Tables 1, 2, 3, and 4.

This Bid includes all costs of performing the work as specified in the Solicitation and Contract Documents, including supervision, labor, materials and supplies, services, equipment, permits, insurance, and all other costs necessary for the completion of the work as specified herein. Reference Measurement and Payment subsections 4.1 and 4.2 in the relevant sections of the Technical Specifications for a description of the scope of work to be executed by Contractor.

**BID TABLE 1**

| Item No. | Item | Quantity | Unit | Unit Cost | Extended Cost |
|---|---|---|---|---|---|
| 1 | Mobilization, Bonds, and Construction Facilities | 1 | LS | | |
| 2 | Demobilization | 1 | LS | | |
| 3 | Site Preparation Activities | 1 | LS | | |
| 4 | Temporary Fence Around Project Area | 1 | LS | | |
| 5 | Construction Phase, Storm water Pollution Prevention Controls | 1 | LS | | |
| 6 | Decommission – Storm Drain Utility | 1 | LS | | |
| 7 | Decommission – Sanitary Sewer Utility | 1 | LS | | |
| 8 | Decommission – Water Lines | 1 | LS | | |
| 9 | Removal of Underground SVE Piping and Appurtenances | 1 | LS | | |
| 10 | Demolition of Building 231 Slab | 3,950 | SF | | |
| 11 | Demolition of Building 230 RU AC Pavement | 3,260 | SF | | |
| 12 | Demolition of Building 38 RU AC Pavement | 5,550 | SF | | |
| 13 | Demolition of Building 207 RU Pavement | 480 | SF | | |
| 14 | Demolition of Building 231 RU (Including Gorgas Avenue) Pavement | 43,130 | SF | | |
| 15 | Demolition of Sidewalk on Mason Street | 330 | SF | | |

| Item No. | Item | Quantity | Unit | Unit Cost | Extended Cost |
|---|---|---|---|---|---|
| 16 | Dewatering | 1 | LS | | |
| 17 | Removal of Decommissioned Underground Utilities | 1 | LS | | |
| 18 | Recycling – Concrete and Brick | 2,000 | TONS | | |
| 19 | Recycling – Asphalt | 1,250 | TONS | | |
| 20 | Recycling – Scrap Metal | 50 | TONS | | |
| 21 | Recycling – Plastic | 25 | TONS | | |
| 22 | Waste Characterization and Class III Disposal | 1,000 | TONS | | |
| 23 | Waste Characterization and Class II Disposal – Soil | 9,100 | TONS | | |
| 24 | Waste Characterization and Class I Non RCRA Disposal – Hazardous Waste | 24,000 | TONS | | |
| 25 | Waste Characterization and Class I RCRA Disposal – Hazardous Waste | 2,200 | TONS | | |
| 26 | Installation of Temporary Sanitary Sewer Connection | 735 | LF | | |
| 27 | Protection for Telecommunication Lines | 1 | LS | | |
| 28 | Protection for 72-inch Storm Drain Line | 1 | LS | | |
| 29 | Installation of New Underground Water Piping | 270 | LF | | |
| 30 | Fire Sprinkler Design for Building 230 | 1 | LS | | |
| 31 | Fire Sprinkler System Installation for Building 230 | 1 | LS | | |
| 32 | Backfilling of RU Excavations | 21,600 | TONS | | |
| 33 | Pavement Replacement – 230 RU | 3,260 | SF | | |
| 34 | Pavement Replacement – 38 RU | 5,500 | SF | | |
| 35 | Pavement Replacement – 207 RU | 480 | SF | | |
| 36 | Gorgas Avenue Replacement | 3,415 | SF | | |
| 37 | Pavement Striping and Marking | 1 | LS | | |
| 38 | Installation of Sanitary Sewer Piping Following 230 RU Backfilling | 300 | LF | | |

| Item No. | Item | Quantity | Unit | Unit Cost | Extended Cost |
|---|---|---|---|---|---|
| 39 | Installation of New Sanitary Sewer Manholes | 2 | EA | | |
| 40 | Installation of Storm Drain Line Behind Building 231 RU | 50 | LF | | |
| 41 | Installation of Storm Drain Infrastructure Inside Building 231 RU (Including Drain Inlet and Tideflex Valve) | 140 | LF | | |
| 42 | Installation of New Drain Inlets | 2 | EACH | | |
| 43 | New Raised Path Along Halleck/Gorgas | 320 | LF | | |
| 44 | New at Grade Path Along Building 230 | 200 | LF | | |
| 45 | New AC Curb | 315 | LF | | |
| 46 | Post Construction Phase, Storm Water Pollution Prevention Controls | 1 | LS | | |
| 47 | ADA Ramp on West Side of Halleck Avenue | 1 | LS | | |
| 48 | Sidewalk Replacement on Mason Street | 330 | SF | | |
| 49 | ADA Ramp on East Side of Halleck Avenue | 1 | LS | | |
| 50 | Pre Construction Survey | 1 | LS | | |
| 51 | Excavation Record Survey | 1 | LS | | |
| 52 | Post Construction Survey | 1 | LS | | |
| 53 | Seeding of Former Building 207 RU | 12,000 | SF | | |
| 54 | Seeding of Former Building 38 RU | 400 | SF | | |
| 55 | Installation of Irrigation System | 1 | LS | | |

LS = lump sum; SF = square footage; EA = each; LF = linear foot
RCRA = Resource Certification Recovery Act; RU = Remedial Unit
AC = asphaltic concrete; ADA = American Disabilities Act

**BID TABLE 2**

Provide all hourly rate of all equipment with operator to be used during the project on the following sheet and attach to this bid proposal. Hourly rates are binding and may also be used at the trust's discretion as the basis for negotiation for additions and reductions to the scope of work.

| **EQUIPMENT TYPE/MAKE AND MODEL NUMBER** | | | | **HOURLY RATE WITH OPERATOR** | |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |

| **EQUIPMENT TYPE/MAKE AND MODEL NUMBER** | | | | **HOURLY RATE WITH OPERATOR** | |
|---|---|---|---|---|---|
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |

B. Project Personnel

1. Provide the names of the personnel from your firm who will be assigned to the project. Submit professional resumes upon Trust's request.

Project Manager/Principal in Charge:_____

Site Superintendent: _____

Foreman: _____

Email: _____

Contractors' License Number(s): _____

Contractors' License Expiration Date(s): _____

C. In the event there is a difference between a unit price and the extended total, the unit price will be held to be the intended bid. If the bidder shows only the total price but fails to enter a unit price, the total divided by the estimated quantity will be held to be the intended unit price.

D. Any bid price for items indicated above which are unbalanced as to price may be rejected as non-responsive. An unbalanced bid is one that is based on price significantly less than cost for some work and/or price which is significantly overstated for other work.

E. Bidder's List of Subcontractors and Suppliers

Business Name: _____

Address: _____

Type of Service: _____

Contact Person: _____ Phone: _____

Dollar Amount: $_____ Percent of Project: _____

_____ Small Disadvantaged _____ Women-Owned Small _____ Small
_____ Large _____ Subcontractor _____ Supplier

Business Name: _____

Address: _____

Type of Service: _____

Contact Person: _____ Phone: _____

Dollar Amount: $_____ Percent of Project: _____

_____ Small Disadvantaged _____ Women-Owned Small _____ Small
_____ Large _____ Subcontractor _____ Supplier

Business Name: _____

Address: _____

Type of Service: _____

Contact Person: _____ Phone: _____

Dollar Amount: $_____ Percent of Project: _____

_____ Small Disadvantaged _____ Women-Owned Small _____ Small
____ Large _____ Subcontractor _____ Supplier

F. Bidder's Proposed Waste Disposal Facilities

**CLASS III DISPOSAL FACILITY**

Name of Facility: _____

Address of Facility: _____

_____

Class of Facility: _____

Site Identification No.: _____

Contact Person and Telephone No.: _____

**CLASS II DISPOSAL FACILITY**

Name of Facility: _____

Address of Facility: _____

_____

Class of Facility: _____

Site Identification No.: _____

Contact Person and Telephone No.: _____

**CLASS I DISPOSAL FACILITY (For Non RCRA Hazardous Waste)**

Name of Facility: _____

Address of Facility: _____

_____

Class of Facility: _____

Site Identification No.: _____

Contact Person and Telephone No.: _____

**CLASS I DISPOSAL FACILITY (For RCRA Hazardous Waste)**

Name of Facility: _____

Address of Facility: _____

_____

Class of Facility: _____

Site Identification No.: _____

Contact Person and Telephone No.: _____

G. Signature

By: _____
(Signature of Bidder's Authorized Representative)

Typed Name & Title: _____

Name of Firm: _____

Address: _____

_____

Telephone: _____ Fax: _____

Email: _____

Contractor's License Number(s): _____

Contractor's License Expiration Date(s): _____

**PART 2 PRODUCTS**

Not used.

**PART 3 EXECUTION**

Not used.

**PART 4 MEASUREMENT AND PAYMENT**

Not used.

**END OF SECTION**

# SECTION 01110

# SUMMARY OF WORK

## PART 1 GENERAL

### 1.01 REFERENCES

A. Final Corrective Action Plan, Building 207/231 Area, Presidio of San Francisco, California (CAP), (*MACTEC, 2007c*)

B. Addendum to Final Corrective Action Plan, Building 207/231 Area, Presidio of San Francisco, CA (*MACTEC, 2008b*)

C. Final Corrective Action Implementation Work Plan, Building 207/231 Area, Presidio of San Francisco, California (Work Plan), (*MACTEC, 2008c*)

### 1.02 SUMMARY

A. Work includes surveying, removal of asphalt and concrete pavement and debris, utility decommissioning and temporary relocation, onsite excavation and characterization of contaminated soil (corrective action),dewatering, backfilling, replacement of paving, replacement of existing utilities, curbs, grading, surveying, transportation and off-site disposal of contaminated soils, pavement and debris, and other work as described in these specifications. Location of work is Building 207/231 Area, Presidio San Francisco, California. Work areas within the Building 207/231 Area include Building 38 and 38-A Garage Remedial Unit, Building 207 Remedial Unit, Building 208 Sump Remedial Unit, Building 228 Remedial Unit, Building 230 Remedial Unit and Building 231 Remedial Unit.

B. The corrective action activities shall be conducted to remove impacted materials and debris to achieve the proposed Presidio-specific cleanup levels. The work is to implement the corrective actions associated with excavation as described in the Corrective Action Implementation Work Plan Building 207/231 Area Presidio of San Francisco, California (*MACTEC, 2008c*).

### 1.03 WORK INCLUDES

A. Setting up excavation temporary facilities and controls including installation of temporary fencing, staging areas, dewatering system, equipment storage, office trailers, traffic control and signage, exclusion and contamination reduction zones, health and safety stations, protection of historical structures, and storm water pollution prevention and erosion control measures, as applicable.

B. Vegetation removal (grubbing) and demolition of pavement and other structures indicated on the Contract Drawings. Demolition or protection of utilities and other features within the indicated limits of work.

C. Preconstruction survey.

D. Decommissioning utilities, which are within excavation footprint.

E. Removal of underground piping and vaults associated with a soil vapor extraction (SVE) system; the aboveground system components are being removed by others.

F Removal of utilities, located inside the excavation footprints.

G Providing temporary (during excavation activities) and permanent utility service (after completion of excavation activities) for tenants affected at and around the project site.

H. Excavation of contaminated soil and off-site disposal.

I. Over-excavation as directed by the Owner in areas where cleanup levels are exceeded. Conducting an excavation record survey.

J. Dewatering of excavation including potentially Polychlorinated Biphenyl (PCB) contaminated water, if required and approved by the Owner.

K. Disposal of accumulated water extracted from the excavation to the Trust's sanitary sewer system, pending confirmation of compliance with the Trust's Industrial Wastewater Discharge Permit.

L. Transportation and Disposal of PCB-impacted water in accordance with federal and state regulations.

M. Backfill and grading of excavated areas.

N. Pavement and seeding as outlined in these specifications.

O. Conducting a post-construction survey.

## 1.04 LOCATION

A. The Building 207/231 Area is located to the northeast of the Main Post area, and to the northwest of the former Letterman Complex. The areas to be excavated lie east

of Halleck Street, west of Marshall Street, south of Old Mason Road and north of Lincoln Boulevard.

## 1.05 EXISTING SITE FEATURES

A. Contractor is responsible for the protection of existing pavement, vegetation, structures, equipment, utilities, and other features to remain.

1. Protect all structures and features within and adjacent to the work area.

2. Repair or replace portions of existing work that has been damaged during construction operations to match existing or adjoining work, as approved by the Owner.

3. Protect historical structures as described within these Construction Documents.

B. Foundations of buildings and structures near excavations are to be protected from damage by benching and sloping and maintaining required horizontal separation.

## 1.06 EXISTING SITE CONDITIONS

A. Soil and groundwater contaminant concentrations encountered during previous investigations are illustrated on the Contract Drawings and described in Section 2302 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. Petroleum hydrocarbons in the diesel, gasoline, and fuel oil range, volatile organic compounds, polynuclear aromatic hydrocarbons, polychlorinated biphenyls, pesticides and metals are present in soil beneath the remedial units. The following remedial units contained the following contaminant sources:

1. Building 38 Remedial Unit – This remedial unit formerly contained a garage and gas station according to historical site maps. USTs,and ASTs were not observed on the historical site maps. The garage and gas station were removed. The southern portion of the remedial unit is asphalt paved; the middle portion contains surface and subsurface support structures for Doyle Drive. The northern portion is covered with turf grass. A storm drain line runs through the northern portion of this remedial unit. The middle portion lies within a CALTRANS right of way and shall not be excavated as indicated on the Construction Drawings.

2. Building 207 Remedial Unit – This remedial unit formerly contained USTs, associated pump islands and product piping. The USTs, pump islands and product piping have been removed. The UST excavations were backfilled with pea gravel, imported soil and low temperature thermal desorption (LTTD) material. The area is covered with turf grass and weeds. A major

communication line runs through the eastern half of this remedial unit.

3. Building 208 Remedial Unit – This remedial unit formerly contained a car wash and sump that have been removed. The area is asphalt concrete (AC) paved.

4. Building 228 Remedial Unit (Information Only—NIC [Not in this Contract]) – The area south of Building 228 contained a fuel distribution system (FDS) line and the area north of Building 228 contained three USTs. Both the FDS and USTs have been removed. The area is AC paved. Known utilities in the area south of Building 228 include overhead power lines and pole, below ground gas, water and stormdrain lines. Known utilities in the area north of Building 228 include overhead power lines and pole and a stormdrain line.

5. Building 230 Loading Dock Remedial Unit – This area contained a railroad spur along the eastern side of the building. The railroad spur has been removed. The area is AC paved. A water line that serves Building 230 runs through the area. Debris associated with a former rail spur may be present in the area. Building 230 is an historic structure.

6. Building 231 Remedial Unit – The area north of existing Building 231 formerly contained USTs which have been removed. Six hydraulic lifts were formerly located within the building footprint itself and have since been removed. The area is AC paved. Numerous utilities run through the area including but not limited to water, sewer, storm drain, communication, power and natural gas lines. Wells and piping associated with the SVE system exist within the site.

B. Geologic and Hydrogeologic Conditions: Lithologic logging of borings drilled in the area shows that soil in the area consists of fill material, shallow sand and bay mud. The fill material is a heterogeneous mixture of various soil types including clay, silt, sand, and gravel and generally contains anthropogenic debris including brick, asphalt, concrete, wood, metal, wire, and porcelain. The shallow sand is typically a heterogeneous mixture of sand, silt, gravel, and construction debris. The Bay Mud consists of soft silt and fat clay with peat and fine sand lenses. Geologic conditions are further described in Section 2302 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.

C. Archeological Investigation: The Anthropological Studies Center at Sonoma State University conducted a subsurface geoarchaeological survey in the area. No prehistoric artifacts were identified. Two paleosols (or “old soil” representing stable land surfaces in the past) were revealed: an upper and lower dune, dating to the Holocene/historic era and Holocene, respectively. The soils were poorly formed, suggesting that they were available for human use for only a limited period

of time. The historic surface soil was also identified under fill. Several historic-era artifacts were identified within landfill deposits; all were isolated items without research value. However, archeological monitoring will occur during construction excavation by the Owner.

## 1.07 LOCATION OF UNDERGROUND FACILITIES

A. Approximate locations of underground utilities, which may be encountered, are illustrated on the Contract Drawings. The Contractor shall hire an underground utility locator, who will verify location and depth of all existing utilities in the vicinity of the work.

## 1.08 DEFINITIONS

A. "Directed", "designated", "selected" or words of similar import: Direction, designation, selection or similar action of Owner is intended, unless stated otherwise.

B. "Require" and words of similar import: As required to complete the work, and as required by Owner, unless stated otherwise.

C. "Perform": Contractor, at his expense, shall perform operations necessary to complete work, including furnishing of necessary labor, tools and equipment, and further including furnishing and installing of materials indicated, specified or required to complete such performance.

D. "Furnish" (materials): To supply and deliver to the project ready for installation and in operable condition.

E. "Install" (services or labor): To place in final position, complete, anchored, connected, and in operable condition.

F. "Provide": To furnish and install complete. When neither furnish, install, nor provide is stated, provide is implied.

G. "Approved substitute", "Other acceptable manufacturer", "equal", "acceptable equal", "equivalent" and words of similar import: It shall be understood such words are followed by expression "in opinion of Owner", unless stated otherwise.

H. "Acceptable", "acceptance" or words of similar import: Acceptance or approval of Owner is intended unless stated otherwise.

I. "At no extra cost to Owner", "with no extra compensation to Contractor", "at Contractor's expense", or terms of similar import: Such terms shall be understood

to mean that Contractor shall perform or provide specified operation of work at no increase to Contract Sum stated in executed Contract.

J. "NIC": Work of this Project that is not being performed or provided as part of this Contract; term shall mean "not in this Contract" or "not a part of work to be performed or provided by Contractor". "NIC" work is indicated as aid to Contractor in scheduling amount of time and materials necessary for completion of Contract.

K. "Workmanship": As defined and accepted by the Owner, word as applied to Specifications means that endeavors by Contractor and others engaged upon work which reflects skillful craftsmanship and personal pride found in efforts applied by experienced, trained, and competent journeymen, mechanics, workers, and artisans.

L. "Approval": The word "approval" when used anywhere in the drawings or specifications means "approval by the Owner or his authorized representatives". Only the Owner Contracting Officer is authorized to bind the Owner and make changes to the Contract.

M. "Owner": Presidio Trust and Presidio Trust Representative.

N. Standard Specifications: The Standard Specifications of the State of California, Department of Transportation (Caltrans) (May 2006) are an integral part of these Specifications.

0. “ENGINEER”: MACTEC Engineering and Consulting, Inc.

## PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

Not used.

## PART 4 MEASUREMENT AND PAYMENT

Not used.

**END OF SECTION**

# SECTION 01140

# WORK RESTRICTIONS

## PART 1 GENERAL

### 1.01 SPECIAL SCHEDULING REQUIREMENTS

A. Have materials, equipment, and personnel required to perform the work at the Site prior to the commencement of the work.

B. Contractor shall coordinate a site visit with the Owner to review staking and delineation of the limits of work performed in accordance with Section 01720 FIELD SURVEYS AND CONTROL.

C. Notify Owner 5 days prior to delineating with temporary fencing the contractor work areas.

D. Permission to interrupt any roads, and/or utility services shall be requested in writing a minimum of 15 calendar days prior to the desired date of interruption.

E. Excavation and backfilling will be delayed during the analysis of confirmation samples collected by the Owner from the excavations. No payment will be made for standby time or delays due to sampling and analysis activities.

### 1.02 PAYMENT

A. Separate payment will not be made for Work performed under this Section. All costs associated with this section shall be included in the unit or lump sum prices for the related Work.

### 1.03 WORKING HOURS

A. Regular working hours shall consist of Monday through Friday 7:00 AM to 6:00 PM, excluding Government holidays.

### 1.04 WORK OUTSIDE REGULAR HOURS

A. No work shall be performed outside regular working hours.

## 1.05 OCCUPIED BUILDINGS

A. The Contractor shall be working around existing buildings, which are occupied. Do not enter the buildings without prior approval of the Owner.

## 1.06 TRANSPORTATION AND DISPOSAL OF MATERIALS

A. Contractor shall provide personnel solely dedicated to monitoring and directing hauling operations if thirty or more trucks are routed through the Presidio in any single day.

## PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

Not used.

## PART 4 MEASUREMENT AND PAYMENT

Not used.

**END OF SECTION**

# SECTION 01320

# CONSTRUCTION PROGRESS DOCUMENTATION

## PART 1 GENERAL

### 1.01 CONSTRUCTION SCHEDULE

A. Within 10 calendar days after receipt of the Notice of Award, prepare and submit to the Owner for approval a construction schedule in the form of a progress chart. Schedule shall be submitted in accordance with SECTION 01330 SUBMITTAL PROCEDURES.

### 1.02 UPDATED SCHEDULES

A. Update the construction schedule weekly or when changes occur. Annotate changes occurring since the last update.

### 1.03 SUBMITTALS

A. The following shall be submitted prior to initiation of construction in accordance with Section 01330 SUBMITTAL PROCEDURES:

1. Construction Schedule.

### 1.04 PROGRESS MEETINGS

A. Meetings to discuss progress shall include twice monthly onsite meetings or other regular intervals mutually agreed to at the preconstruction meeting. During the meetings, the Contractor shall describe work progress and propose schedule, sequence and methods and other revisions as appropriate.

## PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

Not used.

## PART 4 MEASUREMENT AND PAYMENT

Not used.

**END OF SECTION**

# SECTION 01330

# SUBMITTAL PROCEDURES

## PART 1 GENERAL

### 1.01 SUMMARY

A. Provide submittals according to the submittal register included at the end of this section. Final payment will not be made until all submittals have been received and approved by the Owner.

### 1.02 DEFINITIONS

A. Submittal: Shop drawings, product data, samples, operation and maintenance data, plans, and administrative submittals shall be presented for review and approval.

### 1.03 SHOP DRAWINGS

A. Drawings, diagrams and schedules specifically prepared to illustrate some portion of the work.

B. Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system into the project.

C. Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work shall be coordinated.

### 1.04 PRODUCT DATA

A. Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials or equipment for some portion of the work.

### 1.05 DESIGN DATA

A. Calculations, mix designs, analyses or other data pertaining to a part of work.

## 1.06 TEST REPORTS

A. Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements.

B. Reports including findings of a test made at the job site or on a sample taken from the job site, or on a portion of work during or after installation.

## 1.07 CERTIFICATES

A. Statements signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

B. Document required of Contractor, or of a supplier, installer or subcontractor through Contractor, the purpose of which is to assure quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.

C. Confined space entry permits.

## 1.08 CLOSEOUT SUBMITTALS

A. Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

## 1.09 USE OF SUBMITTAL REGISTER

A. Maintain submittal register provided at the end of this section, as the work progresses. Do not change data that is output in columns as delivered by Owner; retain data that is output in columns as approved.

1. Contractor Action Code and Action Code: Entries used will be as follows (others may be prescribed by Transmittal Form):

a. NR - Not Received

b. AN - Approved as noted

c. A - Approved

d. RR - Disapproved, Revise, and Resubmit

2. Copies Delivered to the Owner

   a. Deliver one copy of submittal register with all Preconstruction Submittals prior to mobilization.
   b. Deliver one copy of submittal register updated by contractor to Owner with each invoice request.

## 1.10 PROCEDURES FOR SUBMITTALS

A. Reviewing, Certifying, and Approving Authority: The Owner shall be responsible for reviewing and certifying that submittals are in compliance with contract requirements. Approving authority on submittals is the Owner unless otherwise specified for specific submittal.

B. Scheduling:

1. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work is not delayed by submittal processing. Allow for potential requirements to resubmit.

2. Except as specified otherwise, allow review period, beginning with receipt by approving authority that includes at least 15 working days for submittals for Owner approval. Period of review for submittals with Owner approval begins when Owner receives submittal from the Contractor. Period of review for each re-submittal is the same as for initial submittal.

C. Alternate Submittal Format: Submittals may be electronically mailed or faxed to the submittal reviewer for approval. Documents that are unreadable after being faxed to the recipient shall be mailed or e-mailed to provide a clean copy.

## 1.11 VARIATIONS

A. Variations from contract requirements require Owner approval.

## 1.12 CONTRACTOR'S RESPONSIBILITIES

A. Determine and verify field measurements, materials, field construction criteria; review each submittal; and check and coordinate each submittal with requirements of the work and contract documents.

B. Transmit submittals to the Owner in accordance with schedule on approved Submittal Register, and to prevent delays in the work, delays to Owner, or delays to separate contractors.

C. Advise Owner of variation, as required by paragraph entitled VARIATIONS.

D. Correct and resubmit submittal as directed by approving authority. When resubmitting disapproved transmittals or transmittals noted for re-submittal, the contractor shall provide copy of that previously submitted transmittal including all reviewer comments for use by approving authority. Direct specific attention in writing or on resubmitted submittal, to revisions not requested by approving authority on previous submissions.

E. Ensure no work has begun until submittals for that work have been returned as "approved," or "approved as noted", except to the extent that a portion of work must be accomplished as basis of submittal.

## 1.13 OWNER'S RESPONSIBILITIES

A. Note date on which submittal was received from the Contractor, on each submittal for which the Owner is approving authority.

B. Review submittals for approval within scheduling period specified and for conformance with project design concepts and compliance with contract documents.

C. Review each submittal; and check and coordinate each submittal with requirements of work and contract documents.

D. Act on submittals, determining appropriate action based on Owner review of submittal.

E. Identify returned submittals with one of the actions defined in paragraph entitled ACTIONS POSSIBLE and with markings appropriate for action indicated.

F. Check that material is clearly legible.

G. Update submittal register as submittal actions occur and maintain the submittal register until final acceptance of all work.

## 1.14 ACTIONS POSSIBLE

A. Submittals will be returned with one of the following notations:

1. Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of

review by contractor or for being incomplete, with appropriate action, coordination, or change.

2. Submittals marked "approved" "approved as submitted" authorize contractor to proceed with work covered.

3. Submittals marked "approved as noted" or "approval except as noted; resubmission not required" authorize contractor to proceed with work as noted provided contractor takes no exception to the notations.

4. Submittals marked "revise and resubmit" or "disapproved" indicate submittal is incomplete or does not comply with design concept or requirements of the contract documents and shall be resubmitted with appropriate changes. No work shall proceed for this item until re-submittal is approved.

## 1.15 QUANTITY OF SUBMITTALS

A. Submit three copies of shop drawings requiring review and approval by Owner.

## 1.16 APPROVED SUBMITTALS

A. The Owner's approval of submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error that may exist. After submittals have been approved by the Owner, no re-submittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

## 1.17 DISAPPROVED SUBMITTALS

A. The Contractor shall make all corrections required by the Owner and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice in accordance with the Contract Clause "Changes" shall be given promptly to the Owner.

## 1.18 SCHEDULING

A. Adequate time (a minimum of 15 calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals.

**TABLE 1330-1**
**SUBMITTAL REGISTER**

| SPEC SECT. | DESCRIPTION - ITEM SUBMITTED | CLASSIF | TIME ALLW. | DATE REC'D | SUSP. DATE | DATE RET'D. | APPRV. YES/NO | KTR SUB# |
|---|---|---|---|---|---|---|---|---|
| 01320 | Construction Schedule | | | | | | | |
| 01330 | Submittal Register | | | | | | | |
| 01351 | Site Safety and Health Plan | | | | | | | |
| | Exposure Monitoring/Air Sampling Plan | | | | | | | |
| | Decontamination Facilities Layout | | | | | | | |
| | HAZWOPER Qualifications Certificates | | | | | | | |
| 01355 | Environmental Protection Plan | | | | | | | |
| 01500 | Traffic Control Plan | | | | | | | |
| | Utilities Notifications | | | | | | | |
| | Utilities Record Drawings | | | | | | | |
| | Field Superintendent Contact Information | | | | | | | |
| 01502 | Products Data | | | | | | | |
| 01720 | Surveyor Information | | | | | | | |
| | Survey Drawings | | | | | | | |
| 01780 | As-Built Documents | | | | | | | |
| 02111 | Sampling and Analysis Plan | | | | | | | |
| | Dewatering Plan | | | | | | | |
| | Manifests, Waybills and Shipping Documentation | | | | | | | |
| | Laboratory Analytical Results-Soil Waste Profiling | | | | | | | |

| SPEC SECT. | DESCRIPTION - ITEM SUBMITTED | CLASSIF | TIME ALLW. | DATE REC'D | SUSP. DATE | DATE RET'D. | APPRV. YES/NO | KTR SUB# |
|---|---|---|---|---|---|---|---|---|
| 02120 | Waste Management Plan | | | | | | | |
| | Qualifications and Certificates | | | | | | | |
| | Shipping Documents and Packaging Certification | | | | | | | |
| | Description of TSD Facility and Transporter | | | | | | | |
| | Transportation Manifests and Waste Profiles | | | | | | | |
| 02211 | Decommissioning Product Data | | | | | | | |
| 02300 | Waybills and Shipping Documentation | | | | | | | |
| | Import Fill Material Data | | | | | | | |
| | Geotechnical Test Data | | | | | | | |
| 02370 | Product Data | | | | | | | |
| 02481 | Seed Label | | | | | | | |
| | Post Construction Phase Maintenance Plan | | | | | | | |
| 02510 | Product Data | | | | | | | |
| | Test Reports | | | | | | | |
| | Building 230 Sprinkler System Plan | | | | | | | |
| 02531 | Product Data | | | | | | | |
| | Test Reports | | | | | | | |
| 02630 | Product Data | | | | | | | |
| | Test Reports | | | | | | | |
| 02720 | Plant, Equipment and Tools | | | | | | | |
| | Waybills and Delivery Tickets | | | | | | | |
| | Field Density Tests | | | | | | | |

| SPEC SECT. | DESCRIPTION - ITEM SUBMITTED | CLASSIF | TIME ALLW. | DATE REC'D | SUSP. DATE | DATE RET'D. | APPRV. YES/NO | KTR SUB# |
|---|---|---|---|---|---|---|---|---|
| 02742 | Waybills and Delivery Tickets | | | | | | | |
| | Test Reports | | | | | | | |
| | Job Mix Formula Design Data | | | | | | | |
| 02748 | Waybills and Delivery Tickets | | | | | | | |
| | Sampling and Test Reports | | | | | | | |
| 02763 | Equipment Data | | | | | | | |
| | Product Data | | | | | | | |
| | Qualifications | | | | | | | |
| | Volatile Organic Compound Certificates | | | | | | | |
| 02921 | Surface Erosion Control Material Data | | | | | | | |
| | Schedules | | | | | | | |
| | Statements | | | | | | | |
| | Reports | | | | | | | |
| | Certificates | | | | | | | |
| | Records | | | | | | | |
| 03100 | Shop Drawings | | | | | | | |
| | Product Data | | | | | | | |
| | Test Reports | | | | | | | |
| 03307 | Product Data | | | | | | | |
| | Shop Drawings | | | | | | | |
| | Concrete Mixture Proportions Test Reports | | | | | | | |
| | Certificates | | | | | | | |
| 13285 | Protection Plan | | | | | | | |
| | Training Certification | | | | | | | |
| | CIH Qualifications | | | | | | | |
| | Shipping Documentation | | | | | | | |
| | Certificate of Disposal | | | | | | | |

## PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

Not used.

## PART 4 MEASUREMENT AND PAYMENT

Not used.

**END OF SECTION**

# SECTION 01351

# SAFETY, HEALTH, AND EMERGENCY RESPONSE FOR REMEDIATION WORK

## PART 1 GENERAL

### 1.01 REFERENCES

A. American Conference of Governmental Industrial Hygiene (ACGIH) - (1999) Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices

B. ANSI Z358.1 - (1998) Emergency Eyewash and Shower Equipment

C. U.S. National Archives and Records Administration (NARA) 29 CFR 1904 - Recording and Reporting Occupational Injuries and Illnesses

D. NARA 29 CFR 1910 - Occupational Safety and Health Standards

E. NARA 29 CFR 1926 - Safety and Health Regulations for Construction

F. NARA 49 CFR 171 - General Information, Regulations, and Definitions

G. NARA 49 CFR 172 - Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

H. NIOSH Pub No. 85-115 - (1985) Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities

I. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA 10) - (1995) Portable Fire Extinguishers

J. NFPA 241 - (1996) Safeguarding Construction, Alteration, and Demolition Operations

K. U.S. Occupational Safety and Health Administration (OSHA) Regulations (Standard - 29 CFR) 1910

L. OSHA Regulations (Standard - 29 CFR) 1926

M. OSHA Regulations (Standard - 29 CFR) 1926.65/29 CFR 1910.120 Hazardous Waste Operations and Emergency Response Standard

## 1.02 SUBMITTALS

A. The following shall be submitted as part of the pre-construction submittal in accordance with Section 01330 SUBMITTAL PROCEDURES:

1. Site Safety and Health Plan: Submit to the Owner for review.

2. Exposure Monitoring/Air Sampling Program.

3. HAZWOPER Qualifications Certificates: A certificate for each worker performing cleanup operations indicating the workers meet the training and medical surveillance requirements of this contract.

4. Decontamination Facilities: Drawings showing the layout of the personnel and equipment decontamination facilities.

## 1.03 DEFINITIONS

A. Certified Industrial Hygienist: An industrial hygienist is an individual who is certified by the American Board of Industrial Hygiene.

B. Certified Safety Professional: A safety manager, safety specialist, or safety engineer that has passed the CSP exam administered by the Board of Certified Safety Professionals.

C. Competent Person: A competent person is one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

D. First Aid: First aid is any one-time treatment, and any follow-up visit for the purpose of observation, of minor scratches, cuts, burns, splinters, and so forth, which do not ordinarily require medical care, even though provided by a physician or registered professional personnel.

E. Qualified Person: One who, by possession of a recognized degree, certificate, or professional standing, or extensive knowledge, training, and experience, has successfully demonstrated his or her ability to solve or resolve problems related to the subject matter, the work or the project.

F. Safety Officer: The superintendent or other qualified or competent person who is responsible for the on-site safety required for the project. The Contractor quality control person cannot be the safety officer, even through the QC has safety inspection responsibilities as part of the QC duties.

## 1.04 PAYMENT

A. Separate payment will not be made for Work performed under this Section. All costs associated with this section shall be included in the unit or lump sum prices for the related Work.

## 1.05 REGULATORY REQUIREMENTS

A. Work performed under this contract shall comply with OSHA requirements in 29 CFR 1910 and 29 CFR 1926, especially OSHA's Hazardous Waste Operations and Emergency Response Standard 29 CFR 1926.65/29 CFR 1910.120 and state specific OSHA requirements where applicable. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply.

## 1.06 PRECONSTRUCTION SAFETY CONFERENCE

A. Preconstruction Safety Conference will be held prior to the start of work and shall be attended by all Contractor personnel associated with the field work including Safety and Health Manager. Engineer to hold the Preconstruction Safety Conference. The Contractor will be notified 3 days in advance of scheduled meeting. Specific items of importance to cover during the Preconstruction Safety Conference include, but are not limited to: excavation safety, potential contaminants on-site, personal protective equipment requirements, work near heavy machinery, exposure monitoring, and relevant First Aid treatment.

## 1.07 SITE SAFETY AND HEALTH PLAN

A. The Contractor shall develop and implement a Site Safety and Health Plan (SSHP) meeting the requirements of section 01.A.10 of 29 CFR 1910.120/29 CFR 1926.65 (b)(4).

B. Acceptance and Modifications: Prior to submittal, the SSHP shall be signed and dated by the Safety and Health Manager and the Site Superintendent. The SSHP shall be submitted to the Owner for review 15 days prior to the Preconstruction Safety Conference. Deficiencies in the SSHP will be discussed at the preconstruction safety conference, and the SSHP shall be revised to correct the deficiencies and resubmitted for acceptance. Onsite work shall not begin until the plan has been accepted. A copy of the written SSHP shall be maintained onsite. Changes and modifications to the accepted SSHP shall be made with the knowledge and concurrence of the Safety and Health Manager, the Site Superintendent, and the Owner.

C. The Contractor shall include in the Site Safety and Health Plan an inventory of emergency spill response materials as described in Section 02111 EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS, paragraph SPILL RESPONSE MATERIALS.

## 1.08 SITE DESCRIPTION AND CONTAMINATION CHARACTERIZATION

A. Site description and contamination characterization can be found in Section 02111 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL, paragraph EXISTING SITE CONDITIONS.

## 1.09 SAFETY AND HEALTH MANAGER RESPONSIBILITIES

A. Safety and Health Manager shall be an Industrial Hygienist certified by the American Board of Industrial Hygiene.

B. Be responsible for the development, implementation, oversight, and enforcement of the SSHP.

C. Sign and date the SSHP prior to submittal.

D. Conduct initial site-specific training.

E. Provide onsite consultation as needed to ensure the SSHP is fully implemented.

F. Coordinate any modifications to the SSHP with the Site Superintendent, the SSHO, and the Owner.

## 1.10 SITE SAFETY AND HEALTH OFFICER RESPONSIBILITIES

A. The site superintendent/foreman or an alternate shall be designated the Site Safety and Health Officer (SSHO).

B. The SSHO shall have the following qualifications:

1. A minimum of 1 year experience in implementing safety and health programs at hazardous waste sites.

2. Documented experience in construction techniques and construction safety procedures.

3. Working knowledge of Federal and State occupational safety and health regulations.

4. Specific training in personal and respiratory protective equipment program implementation, confined space program oversight, and in the proper use of air monitoring instruments.

5. Assist and represent the Safety and Health Manager in onsite training and the day-to-day onsite implementation and enforcement of the accepted SSHP.

6. Must have worked on similar types of projects that are equal to or exceed the scope of the project assigned with the same responsibilities.

C. Have authority to ensure site compliance with specified safety and health requirements, Federal, state and OSHA regulations and all aspects of the SSHP including, but not limited to, activity hazard analyses, air monitoring, use of PPE, decontamination, site control, standard operating procedures used to minimize hazards.

D. Have authority to stop work if unacceptable health or safety conditions exist, and take necessary action to re-establish and maintain safe working conditions.

E. Consult with and coordinate any modifications to the SSHP with the Safety and Health Manager, the Site Superintendent, and the Owner.

## 1.11 DISPLAY OF SAFETY INFORMATION

A. Display a map denoting the route to the nearest emergency care facility and show location of Presidio Fire Department with emergency phone numbers in clear view of the on-site construction personnel. Presidio Emergency Dispatch phone number is 415-561-5656.

## 1.12 SAFETY MEETINGS

A. Daily Safety Meetings: Hold daily at the project site. Attach minutes showing contract title, signatures of attendees, and a list of topics discussed.

B. New Employee Indoctrination: New employees shall be informed of specific site hazards before they begin work. Documentation of this orientation shall be kept on file at the project site.

## 1.13 PERSONAL PROTECTIVE EQUIPMENT

A. Site Specific PPE Program: Onsite personnel exposed to contaminants shall be provided with appropriate personal protective equipment. Components of levels of protection (B, C, D, and modifications) must be relevant to site-specific conditions, including heat and cold stress potential and safety hazards. Only respirators

approved by NIOSH shall be used. Protective equipment and clothing shall be kept clean and well maintained. The PPE section of the SSHP shall include site-specific procedures to determine PPE program effectiveness and for onsite fit-testing of respirators, cleaning, maintenance, inspection, and storage of PPE.

B. Levels of Protection: The Safety and Health Manager shall establish and evaluate as the work progresses the levels of protection for each work activity. The Safety and Health Manager shall also establish action levels for upgrade or downgrade in levels of PPE. Protocols and the communication network for changing the level of protection shall be described in the SSHP. The PPE evaluation protocol shall address air monitoring results, potential for exposure, changes in site conditions, work phases, job tasks, weather, temperature extremes, individual medical considerations, etc.

C. Initial PPE Components: The following items constitute minimum protective clothing and equipment ensembles to be utilized during this project:

1. Level D. Coverall, hard hat, steel toed boots, work and/or chemical resistant gloves, goggles or safety glasses.

2. Level C protection shall be available to all employees. Level C protection consists of coveralls, hard hat, steel-toed boots, work and/or chemical resistant gloves, goggles or safety glasses, and respirator.

## 1.14 MEDICAL SURVEILLANCE PROGRAM

A. The Contractor's medical surveillance program for workers performing cleanup operations and who will be exposed to contaminants shall meet 29 CFR 1910.120/1926.65 (f).

## 1.15 EXPOSURE MONITORING/AIR SAMPLING PROGRAM

A. The Safety and Health Manager shall prepare and implement an exposure monitoring/air sampling program to identify and quantify safety and health hazards and airborne levels of hazardous substances in order to assure proper selection of engineering controls, work practices and personal protective equipment for affected site personnel.

## 1.16 EXCAVATION AND TRENCH SAFETY

A. Shoring, including sheet piling, shall be furnished and installed as necessary to protect workmen, banks, adjacent paving, structures, and utilities. Shoring, bracing, and sheeting shall be removed as excavations are backfilled, in a manner to prevent caving. Shoring shall be designed by a California registered civil

engineer. Trench safety shall be performed according to 29 CFR Part 1926 Subpart P and as discussed in the Health and Safety Plan.

## 1.17 FALL PROTECTION

A. Fall protection shall be described as defined in 29 CFR Part 1926 Subpart P.

## 1.18 HAZARD COMMUNICATION

A. Contractor shall implement a hazard communication plan that will allow workers to become aware of hazards they may encounter. Workers shall be encouraged to communicate to coworkers and the Site Safety and Health Officer as hazards are discovered.

## 1.19 SANITATION

A. Contractor shall provide sanitary facilities according to Section 01500 TEMPORARY CONSTRUCTION FACILITIES, Paragraph AVAILABILITY AND USE OF UTILITY SERVICES.

## 1.20 SITE CONTROL MEASURES

A. Work Zones: Work zone boundaries (exclusion zone, including restricted and regulated areas; contamination reduction zone; and support zone) and access points shall be established and the boundary delineations shall be included on drawings in the Site Safety and Health Plan.

B. Site Control Log: A log of personnel visiting, entering, or working on the site shall be maintained. The log shall include the following: date, name, agency or company, time entering and exiting site, time entering and exiting the exclusion zone (if applicable).

C. Communication: An employee alarm system that has adequate means of on- and off-site communication shall be provided and installed in accordance with 29 CFR 1910 Section 165. Suggested signal is three blasts from an air horn, with air horn stored at contractor's job trailer. The Engineer (MACTEC) and other Trust contractors will be apprised of the communication protocol and they will follow the protocol while they are on site.

D. Site Security shall be according to Section 01500 TEMPORARY CONSTRUCTION FACILITIES, Paragraph CONTRACTOR TEMPORARY FACILITIES.

E. Ventilation: Contractor shall provide ventilation as needed per Paragraph EXPOSURE MONITORING/AIR SAMPLING PROGRAM.

## 1.21 PERSONAL HYGIENE AND DECONTAMINATION

A. Personnel entering the Exclusion or Contamination Reduction Zones or otherwise exposed or subject to exposure to hazardous chemical vapors, liquids, or contaminated solids shall adhere to the personal hygiene and decontamination provisions. A detailed discussion of personal hygiene and decontamination facilities and procedures to be followed by site workers shall be submitted as part of the SSHP.

B. Equipment Decontamination: Vehicles and equipment used in the EZ shall be decontaminated in the CRZ prior to leaving the site. Procedures for equipment decontamination shall be developed and utilized to prevent the spread of contamination into the SZ and offsite areas.

## 1.22 EMERGENCY EQUIPMENT AND FIRST AID REQUIREMENTS

A. The following items, as a minimum, shall be maintained onsite and available for immediate use:

1. First aid equipment and supplies approved by the consulting physician.

2. Emergency eyewashes that comply with ANSI Z358.1.

3. Fire extinguishers with a minimum rating of 3A:40B:C shall be provided at site facilities and in all vehicles and at any other site locations where flammable or combustible materials present a fire risk.

4. Emergency spill response materials as described in Section 02111 EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS paragraph SPILL RESPONSE MATERIALS.

## 1.23 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

A. An Emergency Response Plan, that meets the requirements of 29 CFR 1910 Section 120 (l) and 29 CFR 1926 Section 65 (l), shall be developed and implemented as a section of the SSHP. In the event of any emergency associated with remedial action, the Contractor shall, without delay, alert all onsite employees that there is an emergency situation; take action to remove or otherwise minimize the cause of the emergency and alert the Owner. Employees that are required to respond to hazardous emergency situations shall be trained in how to respond to

such expected emergencies. The following elements, as a minimum, shall be addressed in the plan:

1. Emergency recognition and prevention.

2. Criteria and procedures for site evacuation (emergency alerting procedures, employee alarm system, emergency PPE and equipment, safe distances, places of refuge, evacuation routes, site security, and control).

3. Route maps to nearest pre-notified medical facility. Site-support vehicles shall be equipped with maps. At the beginning of project operations, drivers of the support vehicles shall become familiar with the emergency route and the travel time required.

4. Emergency alerting and response procedures including posted instructions and a list of names and telephone numbers of emergency contacts (physician, nearby medical facility, fire and police departments, ambulance service, federal, state, and local environmental agencies; as well as Safety and Health Manager, the Site Superintendent, the Owner and/or their alternates).

## 1.24 REPORTS

A. Accident Reports: For recordable occupational injuries and illnesses, the Contractor shall conduct an accident investigation to establish the root cause(s) of the accident and complete the Incident Report and provide to the Owner within 5 calendar days of the accident.

B. Notification: Notify the Owner as soon as practical, but not later than four hours, of any accident meeting the definition of Recordable Occupational Injuries or Illnesses or Significant Accidents. Information shall include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; and brief description of accident (to include type of construction equipment used, PPE used, etc.).

C. OSHA Citations and Violations: Provide the Owner with a copy of each OSHA citation, OSHA report and contractor response. Correct violations and citations promptly and provide written corrective actions to the Owner.

## PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

### 3.01 PERSONNEL PROTECTION

A. Personal Fall Arrest Device: Personal fall arrest device equipment, systems, subsystems, and components shall meet ANSI Z359.1, "Safety Requirements for Personal Fall Arrest Systems". Only a full-body harness with a shock absorbing lanyard or self-retracting lanyard is an acceptable personal fall arrest device.

### 3.02 EQUIPMENT

A. Material Handling Equipment: Material handling equipment such as forklifts shall not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.

1. The use of hooks on equipment for lifting of material must be in accordance with manufacturers printed instructions.

### 3.03 EXCAVATIONS

A. The competent person for excavation performed as a result of contract work shall be on-site when work is being performed in excavations, and shall inspect excavations prior to entry by workers. Prior to any excavation activities the Contractor shall obtain a permit from the Presidio Trust. All underground utilities in the work area shall be positively identified in accordance with Section 01500 TEMPORARY CONSTRUCTION FACILITIES, paragraph LOCATION OF UNDERGROUND FACILITIES.

1. Trench and shoring systems must be identified in the safety plan and activity hazard analysis.

### 3.04 HOUSEKEEPING

A. Clean-up and work area restoration shall be in accordance with Section 01500 TEMPORARY CONSTRUCTION FACILITIES.

### 3.05 UNDERGROUND STORAGE TANKS, DRUMS AND ACM

A. Underground storage tank (USTs), associated piping, drums or other containers and asbestos containing materials (ACM) shall be handled in accordance with Section 02111 EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS paragraph UNDERGROUND STORAGE TANKS, DRUMS AND ACM.

## 3.06 UNEXPLODED ORDNANCE

A. Unexploded ordnance shall be handled in accordance with Section 02111 EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS paragraph UNEXPLODED ORDNANCE.

## PART 4 MEASUREMENT AND PAYMENT

Not used

**END OF SECTION**

# SECTION 01355

# ENVIRONMENTAL PROTECTION

## PART 1 GENERAL

### 1.01 REFERENCES

A. U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA) 33 CFR 328 - Definitions

B. NARA 40 CFR 68 - Chemical Accident Prevention Provisions

C. NARA 40 CFR 260 - Hazardous Waste Management System: General

D. NARA 40 CFR 261 - Identification and Listing of Hazardous Waste

### 1.02 GENERAL REQUIREMENTS

A. The construction site is located within the boundaries of a National Park. The Contractor shall apply every effort to minimize impacts to tenants, visitors, and National Park employees.

B. The Contractor shall minimize environmental pollution and damage that may occur as the result of construction operations. The cultural and environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this contract. The Contractor shall comply with all applicable environmental Federal, State, and local laws and regulations. The Contractor shall be responsible for any delays resulting from failure to comply with environmental laws and regulations.

C. The Contractor shall comply with Construction Document Drawing C-401 Transportation Plan.

### 1.03 SUBCONTRACTORS

A. The Contractor shall ensure compliance of its subcontractors.

### 1.04 PAYMENT

A. Separate payment will not be made for work performed under this Section. All costs associated with this Section shall be included in the unit or lump sum prices for the related Work.

## 1.05 SUBMITTALS

A. The following shall be submitted as part of the pre-construction submittal in accordance with Section 01330 SUBMITTAL PROCEDURES:

1. Environmental Protection Plan for Owner review.

a. Prior to commencing construction activities or delivery of materials to the Site, the Contractor shall submit an Environmental Protection Plan for review by the Owner. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues, which the Contractor must address during construction. Issues of concern shall be defined within the Environmental Protection Plan as outlined in this section. Prior to submittal of the Environmental Protection Plan, the Contractor shall meet with the Owner for the purpose of discussing the implementation of the Environmental Protection Plan.

b. Compliance: No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor shall be responsible for identifying, implementing, and submitting for approval any additional requirements to be included in the Environmental Protection Plan.

c. Contents: The Environmental Protection Plan shall include, but shall not be limited to, the following:

1) Name(s) of person(s) within the Contractor's organization who is (are) responsible for ensuring adherence to the Environmental Protection Plan.

2) Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the Site, if applicable.

3) An erosion and sediment control plan using Best Management Practices (BMPs) as required by State environmental protection regulations to prevent the discharge of pollutants from the site.

4) A spill control plan shall be prepared and include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR

68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The spill control plan shall include a complete inventory of spill response materials including types and amounts as described in Section 02111 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL paragraph SPILL RESPONSE MATERIALS.

5) A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

6) An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become air borne and travel off the project site.

7) A contaminant prevention plan that identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials.

8) A wastewater management plan that identifies the methods and procedures for management and discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, disinfection wastewater, hydrostatic tests and dewatering of potentially contaminated ground water.

9) A sewer spill prevention plan that identifies the methods and procedures for management and cleanup of spills from the temporary sewer line to reroute sewage around the project site. For containment of accidental spills, the Contractor will meet the requirements of the Presidio Trust's Sanitary Sewer Management Plan, dated 23 August 2007 (see attached as Attachment 3). The Trust will be responsible for internal and regulatory agency reporting.

d. Appendix: Copies of all environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents shall be attached, as an appendix, to the Environmental Protection Plan.

## PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

### 3.01 ENVIRONMENTAL PERMITS AND COMMITMENTS

A. The Contractor shall be responsible for obtaining and complying with all environmental permits and commitments required by Federal, State, Regional, and local environmental laws and regulations.

### 3.02 LAND RESOURCES

A. The Contractor shall confine all activities to areas defined by the Drawings and Specifications. Prior to the beginning of any construction, the Contractor shall identify any land resources to be preserved within the work area.

B. Erosion and Sediment Controls: The Contractor shall be responsible for providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations [California Regional Water Quality Control Plan – San Francisco Bay Basin (Region 2), *CRWQCB, 2004*]. The erosion and sediment controls selected and maintained by the Contractor shall follow BMPs as defined by State environmental protection regulations and be such that water quality standards are not violated as a result of the Contractor's construction activities. No uncontrolled runoff shall occur beyond the work area.

C. Contractor Facilities and Work Areas: The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Owner.

### 3.03 WATER RESOURCES

A. Dewatering Operations: Construction operations for dewatering shall be controlled at all times to maintain compliance with existing Federal, State, Regional, and local water quality standards and designated uses of the surface water body. Excavation dewatering shall be performed per this section and Section 02111 EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS. The Contractor shall comply with the State water quality standards and anti-degradation provisions.

## 3.04 AIR RESOURCES

A. Equipment operation, activities, or processes performed by the Contractor shall be in accordance with all Federal and State air emission and performance laws and standards.

B. The Contractor shall maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance.

C. Sound Intrusions: The Contractor shall keep construction activities under surveillance and control to minimize environment damage by noise. The Contractor shall comply with the provisions of the State of California rules.

## 3.05 CHEMICAL MATERIALS MANAGEMENT AND WASTE DISPOSAL

A. Disposal of wastes shall be as directed below, unless otherwise specified in other sections and/or shown on the drawings.

B. Solid Wastes: Solid wastes generated by the Contractor during the time of construction (excluding clearing debris) shall be placed in covered containers or covered stockpiles, which are emptied or removed on a regular schedule. Handling, storage, and disposal shall be conducted to prevent contamination. Segregation measures shall be employed so that no hazardous or toxic waste will become co-mingled with solid waste. The Contractor shall transport solid waste off Presidio property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal.

C. Fuel and Lubricants: Storage, fueling and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants and oil shall be managed and stored in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations.

## 3.06 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

A. In the event that excavation activities unearth historical, archaeological and cultural resources the Contractor shall secure the items, stop work in the immediate area and immediately notify the Owner. The Owner will provide expertise and make further recommendations. All materials encountered during excavation (including bottles and other small items) are the Owner's property until relinquished by the

Owner. Contractor shall continue to work in other locations while resources are evaluated. No standby will be paid during resource evaluation.

B. Historical, archaeological, and cultural resources include all items considered to have historical, archaeological, and cultural value.

C. Building 228, Building 230 and historic walls to the south and west of Building 231 are historical resources and shall be protected as described in these Construction Documents.

1. Building 228 Area

a. Building 228 is an historic structure and no excavation will be performed in this area. The Contractor shall maintain a minimum of 5'-0" working distance from this historic building for any work performed in this area.

2. Building 230 Area

a. Maintain a 3'-0" working distance from the building foundation during construction activities. The existing loading dock cannot be removed and shall be protected. Excavation shall only occur beneath the loading dock if necessary, and be limited to excavation with hand tools.

3. Building 231 Area

a. Building 231 shall be demolished (by others and in a separate contract). The retaining walls to the south and west of Building 231 are historic and shall be protected. The Contractor shall commence the Building 231 RU excavation by maintaining a minimum of 5'-0" working distance from this historic walls. To the extent practicable, the Contractor shall conduct excavation with small equipment (e.g., shovels or a small backhoe, etc.) as necessary to remove impacted soils within this "setback" area.

The Contractor shall install high visibility orange construction fence along the face of the historic walls prior to performing work in the area. The Contractor shall maintain the indicated working distance from the historic walls.

## 3.07 SPECIAL ENVIRONMENTAL PROTECTION REQUIREMENTS

A. Tree Protection: No ropes, cables, or guys shall be fastened to or attached to any tree(s) for anchorage unless specifically authorized by the Owner. Where such special use is permitted, the Contractor shall provide effective protection to prevent damage to the tree and other land vegetative resources. Unless specifically authorized by the Owner, no construction equipment or materials shall be placed or used within the drip line of trees shown on the drawings to be saved.

B. No excavation or fill shall be permitted unless approved by the Owner within the drip line of trees to be saved except as shown on the drawings.

C. U.S. Department of Agriculture (USDA) Quarantined Considerations: The Contractor shall thoroughly clean all construction equipment at the prior job site in a manner that ensures all residual soil is removed and that egg deposits from plant pests are not present. The Contractor shall consult with the USDA Plant Protection and Quarantine (USDA – PPQ) jurisdictional office for additional cleaning requirements that may be necessary.

## 3.08 BIOLOGICAL RESOURCES

A. The Contractor shall not disturb or cause damage to fish, wildlife, and plants including their habitat.

## 3.09 CONTAMINATED MEDIA MANAGEMENT

A. Contaminated environmental media consisting of, but not limited to, ground water, soils, and sediments shall be managed in accordance with this section and Section 02111 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL.

B. Waste water designated for discharge to the Presidio Sanitary Sewer System will be sampled and analyzed by the Owner according to the requirements of the Presidio Water Treatment System and the Presidio Water Treatment Plant Industrial User Class II Wastewater Permit No. 05-0246. The Contractor shall assume the waste water will meet Permit requirements and that no treatment or off-site disposal will be necessary. Waste water shall be managed by the Contractor and discharged at the direction of the Owner.

C. The waste water management plan shall include procedures for management and discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, disinfection wastewater, and dewatering of potentially contaminated ground water. The plan shall include design drawings of the dewatering system for the excavations. The system shall incorporate settling tanks with 115% spill containment. Tanks shall be configured

to allow settlement of sediments and effective separation between liquids and sediments prior to discharging to the Presidio Sanitary Sewer System. The waste water management plan shall satisfy the requirements of Presidio Water Treatment Plant Industrial User Class II Wastewater Permit No. 05-0246. "Disinfection" water used to disinfect potable water lines will not be allowed to be discharged to the ground or to the storm sewer lines and will require discharge to the sanitary sewer system.

D. No non-storm water discharges are anticipated at the Site under regular operating conditions. However, a contingency plan for discharge under the following upset conditions shall be included in the waste water management plan:

1. Discharge of Stored Groundwater From Water Storage Tanks: Dewatering will only be conducted when the Contractor is on site. In the event of a leak from storage tanks(s), the Contractor's personnel will contain the spill using spill containment kits.

2. Discharge of Sewage from Temporary Aboveground Sanitary Sewer Lines: The Contractor will inspect twice daily the aboveground sewage lines. The Contractor will provide a plan for approval by the Stakeholders for recovery of sewage spill during upset conditions; the intent of the plan will be to prevent discharge into the storm drain system and entry into the Crissy Marsh. This plan will also include plan for prevention of discharge to the storm drain system during the installation of utility lines to be installed during the course of this project). In the event of an accidental spill, the containment of the spill will follow the requirements of the Trust's Sanitary Sewer Management Plan (SSMP) (*Trust, 2007*). The Trust will be responsible for completing internal and regulatory agency reporting in accordance with the requirements of the SSMP.

3. Discharge During Refueling of Construction Equipment: In the event of accidental spill during refueling, the Contractor will contain the spill using spill containment kits (see emergency spill response materials as described in Section 02111 EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS, paragraph SPILL RESPONSE MATERIALS, and SECTION 01502 STORM WATER POLLUTION CONTROLS, paragraph PLACEMENT OF SPILL CONTAINMENT KITS).

## 3.10 POST CONSTRUCTION CLEANUP

A. The Contractor shall leave the Site in a neat condition following excavation, backfilling, and off-site disposal of excavated materials. Contractor shall be responsible for terminating any permits obtained during construction.

## PART 4 MEASUREMENT AND PAYMENT

Not used.

**END OF SECTION**

# SECTION 01400

# QUALITY CONTROL AND QUALITY ASSURANCE

## PART 1 GENERAL

### 1.01 REFERENCES

A. Final Corrective Action Plan, Building 207/231 Area, Presidio of San Francisco, California (CAP), (*MACTEC, 2007c*)

B. Addendum to Final Corrective Action Plan, Building 207/231 Area, Presidio of San Francisco, CA (*MACTEC, 2008b*)

C. Final Corrective Action Implementation Work Plan, Building 207/231 Area, Presidio of San Francisco, California (Work Plan), (*MACTEC, 2008c*)

D. Tetra Tech - (*2001*) Presidio-Wide Quality Assurance Project Plan, Sampling and Analysis Plan, Presidio of San Francisco, San Francisco, California (QAPP).

### 1.02 RELATED WORK

A. Requirements for testing by the Contractor and the Owner are described in various sections of these Specifications. Additional requirements and details for testing by the Owner are described in the Work Plan. Where no testing requirements are described, but the Owner decides that testing is required, the requested test shall be performed under current, appropriate standards.

### 1.03 PAYMENT

A. Separate payment will not be made for work performed under this Section. All costs associated with this Section shall be included in the unit or lump sum prices for the related Work.

### 1.04 PAYMENT OF TESTING COSTS BY OWNER

A. Where the tests on Contractor supplied materials indicate conformance, testing costs will be paid by the Owner.

B. Where the tests on Contractor supplied materials indicate nonconformance, retesting costs shall be paid by the Contractor by deducting testing charges from the Contract payments.

C. Owner will pay cost of testing for materials provided by the Owner.

D. Owner will pay cost of chemical analyses for import soils, confirmation samples and other testing where specified as Owner performed testing.

## PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

### 3.01 QUALITY ASSURANCE/QUALITY CONTROL

A. Owner will provide quality control over suppliers, manufactures, and all products provided by Owner for the Work until provided to the Contractor.

B. Contractor shall provide quality control over suppliers, manufacturers, and all products provided by the Contractor, and services, site conditions, and workmanship, to produce Work of specified quality.

C. Contractor shall comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

D. Performance of the Work shall be by persons qualified to produce workmanship of specified quality.

E. All materials and equipment used in the Work shall be subject to observation and testing in accordance with this Specification, and accepted standards to insure conformity with the requirements of the Contract Documents, laws, ordinances, rules and regulations, and/or orders of any public authority having jurisdiction.

F. Contractor shall assist the Owner with the collection of soil samples during confirmation sampling and provide the Owner with visible field controls.

G. Soil samples collected by the Contractor shall be collected, numbered and analyzed in accordance with the Presidio wide QAPP and Appendix I of the Corrective Action Implementation Work Plan as directed by the Owner.

H. Contractor shall conduct the sewer line and water line testing for the sewer and water lines in accordance with these specifications.

### 3.02 REFERENCE STANDARDS

A. Contractor shall conform to reference standards by date of last issue, unless otherwise stated.

B. Contractor shall obtain copies of standards.

C. Should specified reference standards conflict with Contract Documents, Contractor shall request clarification from the Owner before proceeding.

D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

## 3.03 OWNER'S AND IF DELEGATED TO ENGINEER – ENGINEER'S RESPONSIBILITIES

A. Materials supplied by the Owner will meet the requirements and standards set forth in the Specifications.

B. Owner will perform construction observation and testing as specified in individual Specification sections.

C. Owner will contract the services of a California state certified analytical testing laboratory specializing in performing chemical analysis of soil.

D. Owner will make available to the Contractor the results of testing and observation. The Owner will make written results available to the Contractor after review and acceptance. If appropriate, verbal results will be made available to the Contractor to facilitate construction progress.

## 3.04 CONTRACTOR'S RESPONSIBILITIES

A. Contractor shall supply materials and equipment that meet the requirements and standards set forth in the Specifications.

B. Where specific certificates concerning materials and/or equipment are required, Contractor shall secure payment for and prompt delivery of such certificates to the Owner. Such certificates shall be executed by qualified firms acceptable to the Owner, shall include all information required by the Specifications, and shall refer specifically to materials to be used in the project.

C. The Contractor shall provide the Owner with samples of materials and assistance as requested in the performance of construction, observations, and testing.

D. The Contractor shall notify Owner as indicated in specific Specification sections prior to expected time for Work requiring testing or observation.

E. The Contractor shall not be relieved from the obligation to supply materials and perform the Work in accordance with the Contract Documents, by the observations of the Owner in administration of the Contract, nor by observations, tests, or approvals.

F. Observation or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor. Contractor shall make arrangements and pay for additional observations and tests required for Contractor's use.

G. Retesting required due to non-conformance to Specification requirements will be performed by the Contractor at no expense to the Owner.

## 3.05 ACCESS

A. The Owner shall have access to the Work at all times, and the Contractor shall provide proper facilities for such access and inspection.

B. The Contractor shall assist the Owner with sampling and testing as required.

C. Owner reserves the right to perform any desired sampling and testing of the Contractor's Work; however, this shall not relieve the Contractor of the responsibility for adequate performance of the Work.

## PART 4 MEASUREMENT AND PAYMENT

Not used.

**END OF SECTION**

# SECTION 01500

# TEMPORARY CONSTRUCTION FACILITIES

## PART 1 GENERAL

### 1.01 GENERAL REQUIREMENTS

A. Mobilization: The Contractor shall mobilize all labor, materials equipment, tools, and incidentals necessary to complete the work.

B. Site Plan: The Contractor shall prepare a site plan indicating the proposed location and dimensions of any area to be fenced and used by the Contractor, the number of trailers to be used, soil stockpile areas, avenues of ingress/egress to the fenced area and details of the fence installation. Any areas, which may have to be graveled to prevent the tracking of mud shall also be identified. The area to be used for truck staging and routes to and from the truck staging area shall be identified.

C. Employee Parking: Contractor employees shall park privately owned vehicles in the staging area indicated on the Drawings or an area designated by the Owner.

### 1.02 SUBMITTALS

A. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

1. Traffic Control Plan for approval by the Owner (if Contractor is requesting a revision to the plan included in these construction documents) – see Sheet C-401 for Owner recommended Traffic Control Plan.
2. Contractor shall provide temporary facilities noted in the Temporary Controls Plan, Sheet C-103.
3. Utilities record drawings, documenting existing utilities for approval by the Owner.
4. Utilities notifications.
5. The Contractor's field superintendent 24 hour a day contact information including cell phone number.

## 1.03 AVAILABILITY AND USE OF UTILITY SERVICES

A. The Owner will make all reasonably required utilities available to the Contractor from existing outlets and supplies. The Contractor shall carefully conserve any utilities furnished without charge.

B. Prior to using any water, Contractor shall obtain a permit from the Presidio Trust Utility department for a metered hydrant connection. Contact Ms. Corey Smith at 415-561-2124.

C. Sanitation: The Contractor shall provide and maintain within the construction area minimum field-type sanitary facilities approved by the Owner. NPS and Presidio Trust toilet facilities will not be available to Contractor's personnel.

D. Telephone: The Contractor shall make arrangements and pay all costs for telephone facilities desired. The Contractor's field superintendent shall have a cell phone and the cell phone number shall be provided to the Owner.

## 1.04 LOCATION OF UNDERGROUND FACILITIES

A. Approximate locations of underground utilities and other features, which may be encountered, are illustrated on the Contract Drawings. Other underground utilities may be present. The Contractor shall verify location and depth of all existing features in the vicinity of the work prior to starting construction. Locations, dimensions and types of features encountered during excavation shall be recorded on the record drawings as specified in Section 01720 FIELD SURVEYS AND CONTROLS. If utilities other than those indicated are found, Contractor shall notify the Owner. The Contractor shall coordinate utility location with the Presidio Utility Department.

B. The Contractor shall notify Underground Service Alert (USA) prior to initiating excavation activities. No intrusive work shall be performed until USA has been notified and the associated utility mark outs have occurred. Additionally, no intrusive work shall be performed until underground features have been field located by the Contractor. The Contractor shall take the necessary precautions to ensure that no damage occurs to existing features unless otherwise indicated. Damage to existing features resulting from the Contractor's operations shall be repaired at no additional cost to the Owner. Features encountered that were not previously shown or otherwise located shall not be disturbed without approval from the Owner.

C. The Contractor shall notify the Owner in writing 5 days in advance of scheduled excavation activities including mobilization of equipment to the Site. The Contractor will notify Underground Services Alert (USA) to locate utilities in the

immediate vicinity of the proposed work prior to start of excavation activities. The Owner will obtain a Presidio Trust excavation permit prior to start of excavation activities.

D. Notification Prior to Excavation: In addition to the Owner notification of USA, the Contractor shall notify USA to locate utilities in the immediate vicinity of the proposed work 48 hours in advance of the start of excavation activities. The Contractor shall confirm with the Owner 48 hours in advance of construction activities that USA has been notified and the associated USA utility marking has taken place prior to commencement of construction.

E. Contractor shall hire a utility locator company, who will locate the underground utilities at the project site.

## 1.05 PROTECTION AND MAINTENANCE OF TRAFFIC

A. The Contractor shall conform to the Transportation Plan included on Sheet C-401 of the Construction Drawings. The Contractor shall plan and manage construction traffic to ensure compliance with the items discussed below.

1. The Contractor shall maintain and protect traffic on all affected roads during the construction period except as specified and otherwise directed by the Owner. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, separate truck staging area, erection of barricades, placing of lights around and in front of equipment and the work, and the erection and maintenance of adequate warning, danger, and direction signs, shall be as required by the Park Police. The truck staging areas are indicated on the Construction Drawings. Alternative truck staging areas may be identified by Owner prior to commencement of work.

2. The traveling public shall be protected from damage to person and property.

3. The Contractor's traffic on roads, selected for hauling material to and from the Site, shall interfere as little as possible with public traffic.

4. The only allowable haul route for trucks is illustrated on the Contract Drawings (see Sheet C-402). The Contractor shall investigate the adequacy of existing roads and the allowable load limit on these roads. If a temporary road for equipment and material transportation is necessary, the Contractor shall submit a plan for constructing such a road for approval by the Owner. No deviations from the haul route shall be made without Owner’s approval.

5. The Owner will notify tenants, residents, and contractors at the Presidio based on the Contractor's submitted schedule and planned traffic routes and volumes.

6. The Contractor shall be responsible for the repair of any damage to roads caused by construction operations.

7. All loads shall be covered before leaving the Site and shall be free of loose debris.

8. On days where the trucking operation is greater than 30 trips per day, the Contractor will follow requirements of Section 2120, 2.01, LARGE HAUL DAY PROVISIONS.

## 1.06 CONTRACTOR'S TEMPORARY FACILITIES

A. Administrative Field Offices (optional): The Contractor may provide and maintain administrative field office facilities within the construction area. Presidio Trust and NPS office and warehouse facilities will not be available to the Contractor's personnel.

B. Project Boundary: The Contractor shall construct temporary galvanized steel 6-foot high chain link panel fences at location shown on Sheet C-103 of the Contract Drawings for soil and equipment staging and security. The fences shall be adequately anchored with sandbags to prevent displacement during high wind events. Trailers, materials, or equipment shall not be placed or stored outside the fenced areas. Materials and equipment shall not be stockpiled or staged outside the fenced areas. The fenced areas shall remain locked and secure during non-construction hours. Fabric shall be 6-foot chain link, zinc coated (galvanized) No. 9-gauge wire woven in a 2-inch mesh, with a coated wire nominal diameter of 0.148" and diamond count of 20 ½. On all fabric, the top and bottom selvage is to have a knuckled finish, unless specified otherwise in the drawings. Fabric height shall be the same as height of fence specified. Zinc coated fabric shall meet the requirements of ASTM A-392, Class II coating. The Owner will retain the option to have privacy panels erected around the chain link fence; therefore the Contractor shall include this in the bid price.

C. Appearance of Trailers: Trailers utilized by the Contractor for administrative or material storage purposes shall present a clean and neat exterior appearance and shall be in a state of good repair.

D. Maintenance of Project Boundary: Fencing shall be kept in a state of good repair and proper alignment.

E. Contractor must confine construction vehicle traffic to within the limits of the temporary fence. Proposed exceptions are subject to Owner approval.

F. Security Provisions: US Park Police will patrol the area, but the Contractor shall be solely responsible for the security of its own equipment, material, and personnel.

## 1.07 CLEANUP

A. Construction debris, waste materials, packaging material and the like shall be removed from the work site daily or more frequently if requested by the Trust. Any dirt or mud, which is tracked onto paved or surfaced roadways, shall be cleaned away daily.

## 1.08 RESTORATION OF WORK AREA

A. Upon completion of the project and after removal of trailers, materials, and equipment from within the fenced areas, fencing installed by the Contractor shall be removed and will become the property of the Contractor. Areas used by the Contractor for the storage of equipment or material, or other use, shall be restored to the original or better condition.

# PART 2 PRODUCTS

Not used.

# PART 3 EXECUTION

Not used.

# PART 4 MEASUREMENT AND PAYMENT

## 4.1 MEASUREMENT

A. The "Mobilization, Bonds, and Construction Facilities" unit of measure will be a lump sum.

B. The "Demobilization" unit of measure will be a lump sum.

C. The unit of measurement for "Site Preparation Activities" will be a lump sum.

D. The unit of measurement for a "Temporary Fence Around Project Area" will be a lump sum. The measurement shall include construction of temporary fence at the location shown on Sheet C-103 of the Contract Drawings.

## 4.02 PAYMENT

A. Payment will be paid at lump sum prices stated in the Bid Schedule and shall be based on completed work performed in accordance with the Contract Documents. Separate payment will not be made for Work performed under this Section that does not include specific payment provisions. All non-itemized costs associated with this section shall be included in the lump sum price for the Work. Payment will constitute full compensation for all labor, equipment, tools, and incidentals necessary to complete the work.

1. Mobilization, Bonds, and Construction Facilities – Payment will be for mobilization of personnel, equipment, and all other related items to the Site, USA notification, clearance for underground utility services through the services of an underground utility locator.

2. Demobilization – Payment will be for demobilization of personnel, equipment, and all other related items from the Site.

3. Site Preparation Activities – Payment will be for but not limited to setup of office trailer, traffic control measures, and other temporary control facilities such as sanitation facilities, eye wash stations, etc.

4. Temporary Fence Around Project Area – Payment will be to construct a temporary galvanized steel 6-foot high chain link panel fences around the project site in accordance with these specifications.

**END OF SECTION**

# SECTION 01502

# STORM WATER POLLUTION CONTROLS

## PART 1 GENERAL

### 1.01 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced.

**ASTM International**

ASTM D 4439 *(2004*) Geosynthetics

ASTM D4491 (*1999) Revised 2004*); Water Permeability of Geotextiles by Permittivity

ASTM D4533 (*2004*) Trapezoid Tearing Strength of Geotextiles

ASTM D4632 (*1991; Revised 2003*) Grab Breaking Load and Elongation of Geotextiles

ASTM D4751 (*2004*) Determining Apparent Opening Size of a Geotextile

ASTM D4873 (*2002*) Identification, Storage, and Handling of Geosynthetic Rolls and Samples.

### 1.02 GENERAL REQUIREMENTS

A. Contractor shall implement the storm water pollution prevention measures in accordance with the Storm Water Pollution Prevention Plan (SWPPP) (see Appendix A of the Corrective Action Implementation Work Plan) to prevent sediment load in runoff from the Sites.

B. Site Plan: The Contractor shall review Figure A-2 (for SWPPP measures during construction) and Figure A-3 (for SWPPP measures following construction) of Appendix A of the Corrective Action Implementation Work Plan.

C. Post Construction Measures are presented in Section 02370, Erosion and Sediment Control.

### 1.03 SUBMITTALS

A. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

1. Product Data for the Silt Fence, loose straw mulch, straw wattle, and truck rumble pad to be used for erosion control.

## 1.04 STABILIZATION MEASURES

A. The stabilization practices to be implemented shall include placement of silt fences, straw wattles, and/or loose straw mulch. On his daily field report, the Contractor shall record the dates when the major excavation activities occur and when construction activities temporarily or permanently cease on a portion of the site; and when stabilization practices are initiated.

## 1.05 STRUCTURAL MEASURES

A. Describe any other structural practices required to divert flows from exposed soils, store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the Site to the degree attainable in the daily field report.

## 1.06 SILT FENCE FABRIC

A. The Contractor shall provide silt fences to minimize erosion and sediment runoff (see Sheet A-2 the proposed locations of silt fences at the site; the silt fence fabric will be placed underneath the catch basin grates at locations specified on Sheet A-2).

## 1.07 STRAW WATTLES

A. The Contractor shall provide straw wattles as a temporary structural practice to minimize erosion and sediment runoff (see Sheets A-2 and A-3 for the proposed locations of straw wattles at the sites; during construction, the straw wattles will be placed around the catch basins at locations specified on Sheet A-2 and post construction, straw wattle will be placed around the new DI to be installed in the Building 231 RU area). Wattles must be weed free rice straw or equivalent as approved by the Owner. If wattles are used, the wattles shall be properly placed to effectively retain sediment in each independent runoff area, wattles shall be placed as work progresses, wattles shall be removed/replaced/relocated as needed for work to progress in the drainage area.

# PART 2 PRODUCTS

## 2.1 SILT FENCE COMPONENTS

A. The geotextile fabric will comply with the requirements of ASTM D 4439, and shall consist of polymeric filaments, which are formed into a stable network such that filaments retain their relative positions. The filament shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of ester, propylene, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistance to deterioration due to ultraviolet and heat exposure. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of - 0 to 120 degrees F.

The filter fabric shall meet the following requirements:

FILTER FABRIC FOR SILT SCREEN FENCE

| PHYSICAL PROPERTY | TEST PROCEDURE | STRENGTH REQUIREMENT |
|---|---|---|
| Grab Tensile | ASTM D 4632 | 100 pounds (lbs.) min. |
| Elongation (percent) | | 30 percent max. |
| Trapezoid Tear | ASTM D 4533 | 55 lbs. min. |
| Permittivity | ASTM D 4491 | 0.2 sec-1 |
| AOS (U.S. Std Sieve) | ASTM D 4751 | 30 |

## 2.2 STRAW WATTLE COMPONENTS

A. The straw in the wattles shall be sterile weed free rice straw or equivalent. The wattles shall have a standard diameter of 8 to 12 inches and a length of 25 feet. Where the installation of the wattles is required in unpaved areas, the Contractor shall drive a stake through the wattle and into the ground, so the stake is at least 6 inches in the ground and about two inches above the wattle. The Contractor shall excavate a small ditch, with an approximate depth of one third of the diameter of the wattle, place the wattle in the ditch, and shall place a stakes as required to secure each wattle; the stakes will be driven into the ground along the centerline of the ditch to secure the wattle.

Wattles will also be placed around catch basins in paved areas depicted on Figure A-2 of the SWPPP (Appendix A of the Corrective Action Implementation Work Plan).

## 2.3 LOOSE STRAW MULCH

A. Straw: Straw shall be stalks from oats, wheat, rye, barley, or rice and will be weed free and furnished in air-dry condition and with a consistency for placing with commercial mulch-blowing equipment.

# PART 3 EXECUTION

## 3.1 INSTALLATION OF SILT FENCE UNDER CATCH BASIN GRATE

A. The Contractor shall place silt fence fabric underneath the catch basin grate for the catch basins depicted on Sheet A-2.

## 3.2 INSTALLATION OF STRAW WATTLES

A. The Contractor shall drive a stake through the wattle and into the ground, so the stake is at least 6 inches in the ground and about two inches above the wattle (see Sheet A-2 for locations of straw wattle placement).

B. The Contractor will also place wattles around catch basins in paved areas depicted on Figure A-2 of the SWPPP (Appendix A of the Corrective Action Implementation Work Plan).

## 3.3 EROSION CONTROL FABRIC PLACEMENT

A. The Contractor shall place erosion control fabric on the restored side slopes of the Propagule Planting Area (“Building 231 RU Area”) in accordance with Section 02370, Erosion and Sediment Control.

## 3.4 MAINTENANCE

A. The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures. The following procedures shall be followed to maintain the protective measures.

### 3.4.1 SILT FENCE FABRIC MAINTENANCE

A. Silt fence fabric shall be inspected in accordance with paragraph INSPECTIONS. Any required repairs shall be made promptly. Should the fabric on a silt fence

decompose or become ineffective, and the barrier is still necessary, the fabric shall be replaced promptly. When a silt fence is no longer required, it shall be removed.

### 3.4.2 STRAW WATTLE AND LOOSE STRAW MAINTENANCE

A. Straw wattle barriers and loose straw mulch shall be inspected in accordance with paragraph INSPECTIONS. Close attention shall be paid to the repair of damaged wattles. Necessary repairs to barriers or replacement of wattles shall be accomplished promptly. Sediment deposits shall be removed periodically from the wattles. When a straw wattle barrier is no longer required, it shall be removed. The immediate area occupied by the wattles and any sediment deposits shall be shaped to an acceptable grade and in accordance with the recommendations of the Construction Manager.

## 3.5 INSPECTION

A. The Contractor shall assist the Engineer in inspecting disturbed areas of the construction site and areas that have not been finally stabilized. Throughout the construction phase, the Contractor shall assist the Engineer in conducting a thorough inspection of the erosion control and storm water measures deployed at the Site. For each inspection conducted, the Contractor shall assist the Engineer in preparing a report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the SWPPP, maintenance performed, and actions taken. At a minimum, inspections will be conducted weekly and after storm events (see SWPPP Appendix A, Section A.5.2).

## 3.6 WETTING OF ACTIVE UNPAVED DISTURBED AREAS

A. The Contractor shall spray active unpaved disturbed areas with potable water for dust control. The locations of the hydrants are shown on Sheet C-103.

## 3.7 INSTALLATION OF RUMBLE PAD AT TRUCK SITE EXIT

A. The Contractor shall install a rumble pad at the truck exit from the Site to prevent off-site tracking of dirt. The Contractor shall obtain approval for actual location of the rumble pad from the Owner, Engineer, and other stakeholders prior to placement in the field.

## 3.8 PLACEMENT OF SPILL CONTAINMENT KITS

A. The Contractor shall place spill kits (containing gloves, goggles, absorbent pillows, pads, and socks) near each fuel tank and inside each excavator to contain liquid spills

in case of a release. The spill kits will consist of a lever lock top for quick access and a bright yellow label for high visibility.

## PART 4 MEASUREMENT AND PAYMENT

### 4.01 MEASUREMENT

A. Construction Phase, Storm Water Pollution Prevention Controls: The unit of measurement will be on a lump sum basis.

B. Post Construction Phase, Storm Water Pollution Prevention Controls: The unit of measurement will be on a lump sum basis.

### 4.02 PAYMENT

A. Construction Phase, Storm Water Pollution Prevention Controls: Payment will include construction phase erosion control for the site (see Section 02370 for Erosion and Sediment Control). Payment will be for but not limited to deploy storm water pollution prevention and erosion control measures as described in Section 01502 of these technical specifications. Payment will constitute full compensation for all labor, equipment, tools, supplies, and incidentals necessary to complete the work.

B. Post Construction Phase, Storm Water Pollution Prevention Controls: Payment will include post construction phase erosion control for the site (see Section 02370 for Erosion and Sediment Control). Payment will be for but not limited to place erosion control fabric, maintain it until contractor demobilization, and provide instructions to the Owner who will perform the post construction phase erosion control program until revegetation is fully developed and the slopes are stabilized.

**END OF SECTION**

# SECTION 01720

# FIELD SURVEYS AND CONTROL

## PART 1 GENERAL

### 1.01 GENERAL REQUIREMENTS

A. General requirements for survey work to be performed by the Contractor for layout of work features, for performance of work, and for field measurements of work quantities for payment purposes.

### 1.02 SUBMITTALS

A. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

1. Surveyor Information: Contractor shall submit name, address, telephone number, and L.S. Number of Land Surveyor for Owner approval before starting survey work.

2. Survey Drawings: Contractor shall submit a copy of registered site drawings within 7 days of completion for each survey required, original field notebooks and/or electronic data files, and certificate signed by the Land Surveyor that the elevations and locations of the Work are in conformance with Contract Documents. Contractor shall submit the following Survey Drawings for each remedial unit:

    a. Pre-Construction Survey

    b. Excavation Record Survey

    c. Intermediate Backfill Surveys (as required to document multiple backfill payment items, if applicable)

    d. Final Record Survey.

3. Approval by Owner of layout drawings in support of field staking shall be obtained prior to execution of Work.

## 1.03 PAYMENT

A. Separate payment will not be made for work performed under this Section. All costs associated with this Section shall be included in the unit or lump sum prices for the related Work.

## PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

## 3.01 QUALITY CONTROL

A. Registrations: Contractor shall employ a Land Surveyor registered in the State of California and acceptable to the Owner.

B. Equipment: Contractor instruments and other survey equipment shall be accurate, suitable for the surveys required in accordance with recognized professional standards, and in proper condition, adjustment, and calibration at all times.

C. Tolerances: The tolerances in setting survey stakes, permanent survey monuments, project benchmarks, construction control markers, and other survey markers shall be as specified below.

| Type of Line or Mark | Horizontal Position | Elevation |
|---|---|---|
| *Permanent survey monuments* | *1 in 10,000* | *+ 0.01 ft.* |
| *Survey stakes* | *1 in 2,000* | *+ 0.1 ft.* |

D. Data Collection: Contractor shall record surveys with an electronic data collector. Digital survey point file(s), in ASCII format, for each terrain model used for calculations and topographic mapping shall be provided to the Owner within two (2) working days after the completion of each survey. Each line in the ASCII point file(s) shall represent a single survey point, using comma-delimited fields in the following order: POINT NUMBER, NORTHING, EASTING, ELEVATION, DESCRIPTION. The coordinate system (horizontal and vertical) shall be noted in the survey point file.

## 3.02 PROJECT RECORD DOCUMENTATION

A. Progress Documentation: Contractor shall maintain a complete and accurate log of control and survey work as it progresses. Contractor shall record all work changes on an as-built markup set of the Construction Drawings as they occur.

Contractor shall maintain the as-built markup onsite for Owner review during the performance of the work.

B. Pre-Construction Record Survey: Contractor shall perform a survey to establish local site control and mark the excavation boundaries before construction begins.

C. Excavation Record Survey: After completion and acceptance of completed excavations, Contractor shall perform a survey of the excavation, exposed utilities, confirmation sample locations and other completed work. The record survey will include the following:

1. RU excavation elevations at the toe of the excavations and at the top of the excavations
2. Lateral extent of excavation
3. Lines and levels of exposed utilities during excavation.
4. Limits of LUCs (see below for description of how the LUC areas will be developed)
5. Confirmation sampling locations
6. Exposed utilities.

The Contractor shall be responsible for calculating the volume of material excavated during the project.

D. Intermediate Backfill Surveys: After completion and acceptance of each backfill, Contractor shall perform a survey to document the backfill grades. Contractor shall report the calculated backfill volumes for each unit in cubic yards on the Intermediate Backfill Survey drawing. Payment for this item will be included in the Excavation Record Survey line item.

E. Development of LUC Area: The LUC area will be developed by placing stakes and/or survey monuments at the start and the end points of each line of the polygon that defines the LUC for each LUC area. The Contractor shall be responsible for surveying the coordinates of the start and end points and the bearing of each line of the LUC polygon. Prior to conducting the LUC surveying, the Contractor will provide a 3-day notice to the Owner and Engineer so that the locations of stakes/monuments can be approved by the Owner, Engineer, and National Park Service.

F. Final Record Survey (Post-construction survey): After completion and acceptance of site improvements, Contractor shall perform a survey of the work constructed to illustrate dimensions, locations, coordinates, bearings, angles, and elevations of all site work. The Contractor shall locate the LUC polygons on the final record survey.

G. The Engineer will stake the soil confirmation sample locations. The Contractor will survey these locations and incorporate them into the Excavation Record Survey and the Final Record Survey as directed by the Owner.

H. Contractor shall submit Project Record Documents under provisions of Section 01780 CLOSEOUT SUBMITTALS.

## 3.03 EXAMINATION

A. Contractor shall verify locations and accuracy of construction control points prior to starting work and promptly notify the Owner of any discrepancies discovered.

## 3.04 SURVEY REFERENCE POINTS

A. Control datum for survey is indicated on Construction Drawings. Contractor shall locate and protect construction control and reference points prior to starting site work. Contractor shall protect construction control points and preserve permanent reference points during construction. If displaced by the Contractor, replacement of these construction control points will be at the expense of the Contractor.

## 3.05 SURVEY REQUIREMENTS

A. Contractor shall perform all surveys for layout and performance of the Work, reduce the field notes, make necessary calculations, and prepare drawings necessary to carry out such work.

B. Survey Control: Contractor shall establish local control points near the excavation remedial units and at the locations indicated on the Contract Drawings. The work shall be performed and recorded in the NAD 1927 horizontal datum and NAVD 1988 vertical datum as indicated on the Construction Drawings. The elevation of each control point and monitoring well (top of casing) shall be reported in both NAVD 88 and Presidio Low Low Water (PLLW) vertical datums on the Project Record Documents. Benchmarks established by the Contractor shall be referenced to existing control points. The Contractor shall record locations, with horizontal and vertical data, on Project Record Documents.

C. Quality Control: Owner reserves the right to perform any desired checking and correction of the Contractor's surveys; however, this shall not relieve the Contractor of the responsibility for adequate performance of the Work.

D. Contractor shall survey the confirmation sample locations as part of the Excavation Record Survey as directed by the Owner.

## PART 4 MEASUREMENT AND PAYMENT

### 4.01 MEASUREMENT

A. Pre-Construction Surveying: The unit of measurement will be on a lump sum basis.

B. Excavation Record Survey: The unit of measurement will be on a lump sum basis.

C. Post-Construction Survey: The unit of measurement will be on a lump sum basis.

### 4.02 PAYMENT

A. Pre-Construction Surveying: Payment will constitute full compensation for all labor, equipment, tools, supplies, and incidentals necessary to complete the work.

B. Excavation Record Survey: Payment will constitute full compensation for all labor, equipment, tools, supplies, and incidentals necessary to complete the work.

C. Post-Construction Survey: Payment will constitute full compensation for all labor, equipment, tools, supplies, and incidentals necessary to complete the work.

**END OF SECTION**

# SECTION 01780

# CLOSEOUT SUBMITTALS

## PART 1 GENERAL

### 1.01 SUBMITTALS

A. Shop Drawings: As-Built Drawings.

1. As-Built Drawings: The final Computer Aided Design and Drafting (CADD) as-built drawings shall consist of one set of electronic CADD drawing files in the specified format and one set of the approved Working As-Built and Final As-Built Drawings.

### 1.02 PROJECT RECORD DOCUMENTS

A. Owner Furnished Materials: One set of electronic CADD files in the specified software and format revised to reflect all bid amendments will be provided by the Owner at the pre-construction conference.

B. Working As-Built and Final As-Built Drawings: The Contractor shall revise 1 set of paper drawings by red-line process to show the as-built conditions in tandem with work progress. Changes from the Construction Documents, which are made in the work or additional information, which might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes. The working and final as-built drawings and specifications shall indicate, but shall not be limited to, the following information:

1. The actual location, kinds and sizes of all sub-surface utility lines.

2. Correct grade, elevations, cross section, or alignment of earthwork, structures or utilities if any changes were made from contract plans.

3. The topography, invert elevations of gravity drain lines (e.g., storm drains and sanitary sewers) and grades of drainage installed or affected as part of the project construction.

4. Materials and methods used for the work.

C. CADD Drawings: Only personnel proficient in the preparation of CADD drawings shall be employed to modify the as-built drawings or prepare additional new drawings. Additions and corrections to the contract drawings shall be equal in

quality and detail to that of the originals. Line colors, line weights, lettering, layering conventions, and symbols shall be the same as the original line colors, line weights, lettering, layering conventions, and symbols.

1. CADD colors shall be the "base" colors of red, green, and blue. Color code for changes shall be as follows:

   a. Deletions (red) - Deleted graphic items (lines) shall be colored red with red lettering in notes and leaders.

   b. Additions (Green) - Added items shall be drawn in green with green lettering in notes and leaders.

   c. Special (Blue) - Items requiring special information, coordination, or special detailing or detailing notes shall be in blue.

2. When final revisions have been completed, the cover sheet drawing shall show the wording "RECORD DRAWING AS-BUILT" followed by the name of the Contractor in letters at least 3/16 inch high. All other contract drawings shall be marked either "As-Built" drawing denoting no revisions on the sheet or "Revised As-Built" denoting one or more revisions. Original contract drawings shall be dated in the revision block.

## 1.03 PAYMENT

A. Separate payment will not be made for work performed under this Section. All costs associated with this Section shall be included in the unit or lump sum prices for the related Work.

B. Final payment shall not be made until all submittals have been received and approved by the Owner.

## 1.04 PERFORMANCE BOND

A. The Contractor's Performance Bond shall remain effective throughout the construction period.

## 1.05 FINAL CLEANING

A. The premises shall be left broom clean. Stains, foreign substances, and temporary labels shall be removed from surfaces. Paved areas shall be swept and landscaped areas shall be raked clean. The Site shall have waste, surplus materials, and rubbish removed. The project area shall have temporary structures, barricades, project signs, protection and construction facilities removed.

## PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

Not used.

## PART 4 MEASUREMENT AND PAYMENT

Not used.

**END OF SECTION**

# SECTION 02111

# EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL

## PART 1 GENERAL

### 1.01 REFERENCES

A. ASTM D 422 - (1963; R 1998) Particle-Size Analysis of Soils

B. ASTM D 698 - (1991; R 1998) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/cu. ft. (600 kN-m/cu. m.))

C. ASTM D 1556 - (2000) Density and Unit Weight of Soil in Place by the Sand-Cone Method

D. ASTM D 1557 - (2000) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu. m.))

E. ASTM D 2167 - (1994) Density and Unit Weight of Soil in Place by the Rubber Balloon Method

F. ASTM D 2487 - (2000) Classification of Soils for Engineering Purposes (Unified Soil Classification System)

G. ASTM D 2922 - (1996 el) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

H. ASTM D 5434 - (1997) Standard Guide for Field Logging of Subsurface Explorations of Soil and Rock

I. U.S. National Archives and Records Administration (NARA) 40 CFR 302 - Designation, Reportable Quantities, and Notification

J. U.S. National Archives and Records Administration (NARA) 29 CFR 1926 - Safety and Health Regulations for Construction

### 1.02 SUMMARY

A. Work includes the excavation of contaminated soil and debris, stockpiling, waste profiling for disposal requirements, transportation and dewatering. The approximate location of contaminated material is illustrated on the Contract Drawings.

B. Work includes the excavation and off site disposal of geoarchaeological trench spoils. The approximate location of the trench spoils is depicted on the Contract

Drawings and the width and the depth of the trenches are presented as trench logs in Attachment 1.

## 1.03 SOIL REMEDIATION WORK

A. Setting up soil stockpile containment berms, water storage tanks, exclusion and contamination reduction zones, and health and safety stations, as applicable.

B. Contractor shall excavate in accordance with the Contract Drawings. Confirmation soil sampling will be performed by the Engineer with the assistance of the Contractor.

C. Contractor shall conduct additional excavation of contaminated material if analytical results indicate exceedances at excavation sidewalls and/or bottom.

D. Removal of groundwater or surface water that enters the excavations, as needed. Groundwater is expected to be present in the bottom of all excavations. Water inside the excavations shall be pumped out and conveyed to tanks that are capable of settling or filtering out suspended solids as specified in Section 01355 ENVIRONMENTAL PROTECTION (see location of tanks depicted on Sheet C-103). The excavation shall be kept reasonably dry to allow confirmation sampling to proceed without standing water in the excavations. The dewatering system shall be designed and operated to maintain a safe construction site and allow Owner access to excavation sidewalls and bottom for confirmation sampling.

E. Sampling and analysis of water collected in the tanks will be performed by the Owner as described in Section 01355 ENVIRONMENTAL PROTECTION. Waste water shall be disposed as directed by Owner in accordance with Section 01355 ENVIRONMENTAL PROTECTION, paragraph CONTAMINATED MEDIA MANAGEMENT. The Contractor shall obtain authorization from the Owner prior to discharge.

F. Analysis of confirmation samples will be performed by the Owner. The Contractor shall over-excavate at the direction of the Owner should confirmation samples indicate that soil cleanup levels have not been achieved.

G. Excavated material shall be transported to the staging area (stockpile management area) as indicated on the Contract Drawings and stored in stockpiles for profiling prior to off-site disposal.

H. Waste profiling and sampling to determine disposal requirements shall be performed by the Contractor.

## 1.04 LOCATION

A. The remedial units to be excavated are located within the Building 207/231 area, as indicated on the Contract Drawings.

## 1.05 EXISTING SITE FEATURES

A. Contractor is responsible for the protection of existing structures, equipment, utilities, and improvements:

1. Repair or replace portions of existing work that have been damaged during construction operations to match existing or adjoining work, as approved by the Owner.

B. Foundations of buildings, except that of Building 231, shall be protected from damage. The foundation of Building 231 will be removed during excavation activities.

C. Historical features shall be protected from damage (see Sheet C-102 that identifies the on site historic features).

## 1.06 EXISTING SITE CONDITIONS

A. The project involves removal of soil and debris. Subsurface conditions were investigated as part of investigations reported in the Corrective Action Implementation Work Plan Building 207/231 Area Presidio of San Francisco, California (*MACTEC, 2008c*). This information will be provided to the Contractor on request.

B. Geologic and Hydrogeologic Conditions: Lithologic logging of borings drilled in the area shows that Building 207/231 is underlain by approximately 1 to 16 feet of fill material consisting of a heterogeneous mixture of sand, silt, gravel, and construction debris. Beneath the fill, where present, lies 1 to 9 feet of shallow sand consisting of poorly-graded, fine to medium grained sand, clayey to silty sand, and silty sand. Beneath the fill and shallow sand lies approximately 0 (where excavated at the former USTs location) to 12 feet of dark grey to black, soft, elastic organic clays and organic soils (Bay Mud). Shallow groundwater has been encountered at depths ranging from 1 to 13 feet below ground surface (bgs).

C. Contaminants in Soil and Groundwater

1. Soil Contamination: Based on the occurrence of chemicals in soil at concentrations exceeding cleanup levels, the CAP identified the following chemicals of concern (COCs) for soil:

- Petroleum hydrocarbons – Total Petroleum Hydrocarbons (TPH) as gasoline, diesel, fuel oil;
- Volatile Organic Compounds (VOCs) – benzene, toluene, ethylbenzene, xylenes (BTEX), methyl tertiary butyl ether (MTBE), tetrachloroethene (PCE), trichloroethene (TCE), vinyl chloride (VC), bromobenzene, methylene chloride (MeCl);
- Polynuclear Aromatic Hydrocarbons (PAHs) – anthracene, acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(b+k)fluoranthene, benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene, pyrene;
- Polychlorinated Biphenyls (PCBs) and Pesticides – Arochlor 1016, 4,4'-DDD; and
- Metals – arsenic, chromium, cobalt, copper, lead, mercury, silver, and zinc.

2. Soil containing contamination has been identified in 5 distinct remedial units within the Building 207/231 Area. The approximate extent of soil containing contamination above cleanup levels for each remedial unit is indicated on the Construction Drawings. The majority of soil containing contamination above cleanup levels occurs at depths between 0.5 feet and 11 feet bgs.

3. Groundwater Contamination: For groundwater, the CAP identified the following COCs:

- Petroleum hydrocarbons – TPH as gasoline, diesel, fuel oil;
- VOCs – BTEX, MTBE, bromobenzene, 1,2-dichlorobromine (1,2-DCB), 1,2-dichloroethane (1,2-DCA), PCE, TCE, VC;
- PAHs – benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(b+k)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene;
- PCBs – Arochlor 1016; and
- Metals – arsenic, lead, nickel, vanadium, and zinc.

## 1.07 LOCATION OF UNDERGROUND FACILITIES

A. The Contractor shall verify existing underground facilities information and provide notifications in accordance with Section 01500 TEMPORARY CONSTRUCTION FACILITIES, paragraph LOCATION OF UNDERGROUND FACILITIES.

## 1.08 SUBMITTALS

A. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

1. Shoring Plan for Excavation Along Halleck Street: Provide to the Owner within 14 calendar days after Notice of Award, a plan for shoring the excavation along Halleck Street. At a minimum, the Shoring Plan shall include:

    a Schedule of activities
    b Depth of Shoring
    c Material Specifications for the Shoring
    d Execution Approach
    e Execution Sequence.

B. Dewatering Plan: The Contractor shall prepare a dewatering plan that includes, but is not limited to, anticipated flow, number of pumps, description/sketch of groundwater collection method, the wastewater management plan as described in Section 01355 ENVIRONMENTAL PROTECTION, transportation method (if necessary) and disposal method. The dewatering plan shall address dewatering activities necessary during excavation, during non-work hours and weekends, and describe sampling and analysis coordination requirements. The dewatering plan shall also include daily dewatering system monitoring (including non-work hours and weekends), spill prevention methods such as float switch activated pumps and multiple contact phone numbers of Contractor personnel available for response 24 hours a day and 7 days a week in the event of a spill or leak.

C. Manifests, waybills and shipping documentation: Copies of manifests and waybills during the progress of work. Certified waybills shall be provided prior to submission of the request for payment for items requiring waybills.

D. Laboratory analytical results from the soil waste profile sampling.

## 1.09 REGULATORY REQUIREMENTS

A. Permits and Licenses: The Contractor shall obtain required federal, state, and local permits for excavation and storage of contaminated material.

B. Air emissions shall be monitored and controlled in accordance with Section 01351 SAFETY, HEALTH, AND EMERGENCY RESPONSE FOR REMEDIATION WORK.

## 1.10 SAMPLING AND MONITORING

A. The Contractor shall be responsible for pausing work for organic vapor monitoring and confirmation soil sampling. The Contractor shall assist the Owner with confirmation soil sampling. Contractor will be given a request before performing the activity and efforts will be made to not significantly delay work.

B. The Contractor shall manage water storage and perform discharge as directed by the Owner. The Contractor shall assist the Owner with water sampling and analysis per the requirements of Section 01355 ENVIRONMENTAL PROTECTION.

## 1.11 EXCAVATION SEQUENCING

A. The following sequencing for excavation activities is recommended by Owner

1. Building 230 RU Excavation
2. Building 38 Excavation
3. Building 207 RU Excavation
4. Building 208 RU Excavation
5. Building 231 RU Excavation

At the former Building 231 excavation, the Contractor will begin excavating in the area around borings 231GW01 and 231GW112 (which contain PCB above reporting limits), which are located in the southeastern portion of Building 231. Water removed from this area will be handled separately from the remaining extracted groundwater. Once PCB levels in extracted water from this area drop below the threshold level of 1.5 ppb, extracted groundwater from this area will be handled along with the rest of the extracted groundwater from the site.

## 1.12 SCHEDULING

A. The Contractor shall notify the Owner 5 calendar days prior to the start of excavation of contaminated material.

# PART 2 PRODUCTS

## 2.01 SPILL RESPONSE MATERIALS

A. The Contractor shall provide appropriate spill response materials including, but not limited to the following: containers, adsorbents, shovels, and personal protective equipment. The Contractor shall maintain the appropriate types and amount of spill response materials at the Site to handle the anticipated materials, wastes and contaminants at the Site. Spill response materials shall be available at all times when contaminated materials/wastes are being stored, handled or transported. Spill response materials shall be compatible with the type of materials and contaminants. The Contractor shall include an inventory of the spill response materials being provided in the Contractor Environmental Protection Plan-Spill Control Plan submittal described in Section 01355 ENVIRONMENTAL PROTECTION.

# PART 3 EXECUTION

## 3.01 EXISTING STRUCTURES AND UTILITIES

A. The Contractor shall verify existing underground facilities information and provide notifications in accordance with Section 01500 TEMPORARY CONSTRUCTION FACILITIES, paragraph LOCATION OF UNDERGROUND FACILITIES.

## 3.02 PROTECTION

A. Worker protection and excavation shoring, sloping and bracing shall be provided as specified in the Section 02300 EARTHWORK paragraph PROTECTION.

B. Surface water, including rainfall and related runoff, shall be diverted to prevent entry into the excavation. Dewatering shall be limited to that necessary to assure adequate access for construction and confirmation sampling, a safe excavation, and prevent the spread of contamination.

## 3.03 EXCAVATION OF CONTAMINATED MATERIAL

A. The remedial units shall be excavated in accordance with Section 02300 EARTHWORK paragraph EXCAVATION. Excavation shall be performed in a manner that limits spills and the potential for contaminated material to be mixed with uncontaminated material. An excavation log describing visible signs of contamination encountered shall be maintained for each remedial unit.

B. The Owner's Engineer will be present to observe the removal of contaminated material from the Site. After excavation has been completed the Owner will perform a field analysis to determine the presence of contamination.

C. Confirmation soil samples will be collected by the Owner's Engineer from the bottom and sidewalls of the excavation. The Contractor shall assist the Owner to facilitate sample collection.

D. Over-excavation beyond the lines shown on the drawings shall be as directed by the Owner.

E. Excavation of soil with contamination above cleanup levels and excavation of uncontaminated soil may occur concurrently. However, the Contractor will not separate clean and contaminated soils; all excavated soils will be stockpiled together and disposed offsite.

## 3.04 SOIL STOCKPILING

A. Excavated soil and other material shall be placed in stockpiles or storage units immediately after excavation or direct hauled by trucks as described in 3.04, SOIL STOCKPILING, Part D. The following paragraphs describe acceptable methods of material storage. Stockpiles or storage units shall be in good condition and

constructed of materials that are compatible with the material to be stored. If multiple stockpiles or storage units are required, each shall be clearly labeled with an identification number and a written log shall be kept to track the type and source of contaminated material in each temporary stockpile or storage unit.

B. Contractor shall construct stockpiles in a safe manner and to facilitate profile sampling according to the requirements of the disposal facilities. Stockpiles shall be covered at the end of each workday as well as during the workday as directed by the Owner.

Stockpiles shall be constructed to include:

1. A chemically-resistant geomembrane liner free of holes and other damage. Non-reinforced geomembrane liners shall have a minimum thickness of 20 mils. Scrim-reinforced geomembrane liners shall have a minimum weight of 40 lbs. per 1,000 square feet. The ground surface on which the geomembrane is to be placed shall be free of rocks greater than 0.5 inches in diameter and any other object which could damage the membrane.

2. Geomembrane cover free of holes or other damage to prevent precipitation from entering the stockpile. Non-reinforced geomembrane covers shall have a minimum thickness of 10 mils. The cover material shall be extended over the berms and anchored or ballasted to prevent it from being removed or damaged by wind.

3. Berms surrounding the stockpile, a minimum of 6 inches in height. Vehicle access points shall also be bermed.

4. A 6-inch sand layer will be placed under the soil stockpiles. Following removal of the stockpiled soil, this sand will also be removed and disposed offsite.

C. Stockpiles shall be arranged in a manner that will allow access to other soil stockpiles, so one stockpile does not prevent the loading and transport of soil from another stockpile.

D. Alternatively, the Contractor can choose to pre-profile the soils in the excavation areas and direct load the excavation spoils into haul trucks.

## 3.05 CONFIRMATION SAMPLING

A. Soil confirmation sampling will be performed by the Engineer.

B. The Contractor shall assist the Engineer with the collection of soil samples at no extra charge.

C. While the confirmation samples are being analyzed, no payment will be made for standby/downtime associated with analysis, review, and approval of confirmation sampling data.

## 3.06 WASTE PROFILING

A. The Contractor shall profile soil for disposal according to the requirements of the disposal facility. The Contractor shall be responsible for additional samples to be collected from the material to be disposed as required to profile the soil for disposal. Each soil sample collected by the Contractor shall be uniquely identified as directed by the Trust in accordance with Section 01400 QUALITY CONTROL AND QUALITY ASSURANCE.

B. Stored material shall be transported offsite for disposal. Analyses for contaminated material to be taken to an offsite disposal facility shall conform to local, state, and federal criteria as well as to the requirements of the disposal facility. Documentation of all analyses performed shall be furnished to the Owner. Additional sampling and analyses to the extent required by the approved offsite treatment, storage, or disposal (TSD) facility shall be the responsibility of the Contractor and shall be performed at no additional cost to the Owner.

C. Contractor shall assist Owner with waste water sample collection from excavations or waste water tanks. Samples will be collected and analyzed by the Owner in accordance with Section 01355 ENVIRONMENTAL PROTECTION. Contractor shall discharge waste water to the sanitary sewer or handle waste water in accordance with paragraph GROUNDWATER TREATMENT as directed by the Owner.

## 3.07 SPILLS OF HAZARDOUS SUBSTANCES

A. In the event of a spill or release of a hazardous substance (as designated in 40 CFR 302), pollutant, contaminant, or oil (as governed by the Oil Pollution Act (OPA), 33 U.S.C. 2701 et seq.), the Contractor shall notify the Owner immediately. Immediate containment actions shall be taken to minimize the effect of any spill or leak. Cleanup shall be in accordance with applicable federal, state, and local regulations. As directed by the Owner, additional sampling and testing shall be performed to verify spills have been cleaned up. Spill cleanup and testing shall be done at no additional cost to the Owner.

## 3.08 DISPOSAL REQUIREMENTS

A. Offsite disposal of contaminated material shall be in accordance with Section 02120 TRANSPORT AND DISPOSAL OF HAZARDOUS MATERIALS.

B. Contaminated soil shall be disposed at one or more of the Owner approved disposal facilities listed below:

| DISPOSAL FACILITY NAME | ADDRESS |
|---|---|
| Chemical Waste Management, Kettleman Hills Treatment Facility | 35251 Old Skyline Road<br>Kettleman Hills, CA 93239 |
| ECDC Environmental | 970 East Murray-Holladay Road<br>Salt Lake City, UT 84177 |
| US Ecology, Inc. (for the Beatty, NV site)<br>Texas Ecologists, Inc. | 805 W. Idaho, Suite 200<br>Boise, ID 83702-8916 |
| Altamont Recycling and Disposal Facility, A Division of Waste management of Alameda County, Inc. | 10840 Altamont Pass Road<br>Livermore, CA 94550 |
| USA Waste Services, Inc. DBA<br>McKittrick Waste Treatment Site | 56533 Hwy. 58 West<br>McKittrick, CA 93251 |
| Evergreen Environmental Services – North | 5000 Birch Street, Suite 500<br>Newport Beach, CA 92660 |
| TPS Technologies, Inc. | 1964 S. Orange Blossom Tr.<br>Apopka, FL 32703 |
| Ecology Control Industries | 19500 Normandie Avenue<br>Torrance, CA 90502 |
| Clearwater Environmental Mgmt. | P.O. Box 7420<br>Freemont, CA 94537-7420 |
| Safety Clean<br>Buttonwillow, Inc. | 2500 W. Lokern Road<br>Buttonwillow, CA 93206 |
| Forward, Inc. Landfill | 9999 South Austin Road<br>Manteca, CA 95336 |
| Ox Mountain Landfill | 12310 San Mateo Road<br>Half Moon Bay, CA 94019 |
| Keller Canyon Landfill | 901 Bailey Road<br>Pittsburg, CA 94565 |
| Vasco Road Landfill | 4001 North Vasco Road<br>Vacaville, CA 95687 |
| Hay Road Landfill | 6426 Hay Road<br>Vacaville, CA 95687 |

## 3.09 GROUNDWATER TREATMENT

A. If samples collected from water extracted from the excavation do not satisfy the required discharge limits for disposal in the Presidio Sanitary Sewer System as defined in Section 01355 ENVIRONMENTAL PROTECTION, the Contractor shall coordinate with the Owner to treat or dispose the material off-site (Industrial Waste Discharge Permit included in the Appendix C of the Corrective Action Implementation Work Plan).

## 3.10 UNDERGROUND STORAGE TANKS, DRUMS AND ACM

A. In the event an underground storage tank (UST), associated piping, drums or other containers or asbestos containing materials (ACM) are encountered the Contractor shall secure and stop work in the immediate area and notify the Owner immediately. The Contractor shall continue work in other parts of the site. The Owner will coordinate removal of USTs, associated piping, drums or other containers and ACM with others. The Contractor shall coordinate and assist the Owner as directed.

## 3.11 UNEXPLODED ORDNANCE

A. In the event the Contractor uncovers unexploded ordnance (UXO) the Contractor shall cease work in the affected area; remove personnel from the affected area, and notify the Owner immediately. The Contractor shall resume work only upon authorization by the Owner.

# PART 4 MEASUREMENT AND PAYMENT

## 4.01 MEASUREMENT

A. Recycling Concrete and Brick – The unit of measurement will be on a per ton basis. Measurement shall be performed at the recycling facility. The measurement will not include material that is transported and disposed without authorization. Copies of certified waybills from the recycling facility and manifests shall be submitted to document acceptable disposal and payment quantities. Weigh tickets shall include printout that includes the disposal facility name, time, date, truck number, waste description, and weight. Weighing shall be performed on accurately calibrated scales.

B. Recycling – Asphalt – The unit of measurement will be on a per ton basis. Method of measurement and the documentation used for measurement will be similar to that for Recycling of Concrete and Brick.

C. Recycling – Scrap Metal – The unit of measurement will be on a per ton basis. Method of measurement and the documentation used for measurement will be similar to that for Recycling of Concrete and Brick.

D. Recycling – Plastic – The unit of measurement will be on a per ton basis. Method of measurement and the documentation used for measurement will be similar to that for Recycling of Plastic.

E. Waste Characterization and Class III Disposal – The unit of measurement will be on a per ton basis. Measurement shall be performed at the disposal facility. The measurement will not include material that is transported and disposed without authorization. Copies of certified waybills from the disposal facility and

manifests shall be submitted to document acceptable disposal and payment quantities. Weigh tickets shall include printout that includes the disposal facility name, time, date, truck number, waste description, and weight. Weighing shall be performed on accurately calibrated scales.

F. Waste Characterization and Class II Disposal – The unit of measurement will be on a per ton basis. Measurement shall be performed at the disposal facility. The measurement will not include material that is transported and disposed without authorization. Copies of certified waybills from the disposal facility and manifests shall be submitted to document acceptable disposal and payment quantities. Weigh tickets shall include printout that includes the disposal facility name, time, date, truck number, waste description, and weight. Weighing shall be performed on accurately calibrated scales.

G. Waste Characterization and Class I Non RCRA Disposal – The unit of measurement will be on a per ton basis. Method of measurement and the documentation used for measurement will be similar to that for Waste Characterization and Class II Disposal.

H. Waste Characterization and Class I RCRA Disposal – The unit of measurement will be on a per ton basis. Method of measurement and the documentation used for measurement will be similar to that for Waste Characterization and Class II Disposal.

I. Removal of Underground Utilities – The unit of measurement will be on an lump sum basis.

## 4.02 PAYMENT

A. Recycling Concrete and Brick – Payment will include separation of concrete and brick from the other excavation spoils, stockpiling of the concrete/brick in a separate temporary stockpile, and transportation and off-site disposal to a recycling facility. Payment will constitute full compensation for all labor, equipment, tools, supplies, and incidentals necessary to complete the work.

B. Recycling – Asphalt – Payment will include separation of asphalt from the other excavation spoils, stockpiling of the concrete/brick in a separate temporary stockpile, and transportation and off-site disposal to a recycling facility. Payment will constitute full compensation for all labor, equipment, tools, supplies, and incidentals necessary to complete the work.

C. Recycling – Scrap Metal – Payment will include separation of scrap metal from the other excavation spoils, stockpiling of the scrap metal in a separate temporary stockpile, and transportation and off-site disposal to a recycling facility. Payment will constitute full compensation for all labor, equipment, tools, supplies, and incidentals necessary to complete the work.

D. Recycling – Plastic – Payment will include separation of scrap metal from the other excavation spoils, stockpiling of the scrap metal in a separate temporary stockpile, and transportation and off-site disposal to a recycling facility. Payment will constitute full compensation for all labor, equipment, tools, supplies, and incidentals necessary to complete the work.

E. Waste Characterization and Class III Disposal – Payment will include excavation of soil/debris from the Site and transferring to the temporary stockpile location, placing the soil/debris in the stockpile, waste characterization profiling the soil/debris, separation of soil/debris from the other excavation spoils, and transportation and off-site disposal to a Class III Disposal facility. Payment will constitute full compensation for all labor, equipment, tools, supplies, and incidentals necessary to complete the work.

F. Waste Characterization and Class II Disposal of Soil/Debris – Payment will include excavation of soil/debris from the Site and transferring to the temporary stockpile location, placing the soil/debris in the stockpile, waste characterization profiling the soil/debris, separation of soil/debris from the other excavation spoils, and transportation and off-site disposal to a Class II Disposal facility. Payment will constitute full compensation for all labor, equipment, tools, supplies, and incidentals necessary to complete the work.

G. Waste Characterization and Class I Non RCRA Disposal – Payment will include excavation of soil/debris from the Site and transferring to the temporary stockpile location, placing the soil/debris in the stockpile, waste characterization profiling the soil/debris, separation of soil/debris from the other excavation spoils, and transportation and off-site disposal as non RCRA waste at a Class I Disposal facility. Payment will constitute full compensation for all labor, equipment, tools, supplies, and incidentals necessary to complete the work.

H. Waste Characterization and Class I RCRA Disposal – Payment will include excavation of soil/debris from the Site and transferring to the temporary stockpile location, placing the soil/debris in the stockpile, waste characterization profiling the soil/debris, separation of soil/debris from the other excavation spoils, and transportation and off-site disposal as RCRA waste at a Class I Disposal facility. Payment will constitute full compensation for all labor, equipment, tools, supplies, and incidentals necessary to complete the work.

I. Removal of Decommissioned Underground Utilities – Payment will include removal of underground decommissioned utilities and transferring to the temporary stockpile location, placing the removed utilities in the stockpile, pending transport to a recycling facility. Payment will constitute full compensation for all labor, equipment, tools, supplies, and incidentals necessary to complete the work.

**END OF SECTION**

# SECTION 02120

# TRANSPORTATION AND DISPOSAL OF HAZARDOUS MATERIALS

## PART 1 GENERAL

### 1.01 SUMMARY

A. Work includes loading, transportation and disposal of contaminated soil at an approved disposal facility.

### 1.02 REFERENCES

A. U.S. National Archives and Records Administration (NARA) 40 CFR 61 - National Emission Standards for Hazardous Air Pollutants

B. NARA 40 CFR 261 - Identification and Listing of Hazardous Waste

C. NARA 40 CFR 262 - Standards Applicable to Generators of Hazardous Waste

D. NARA 40 CFR 263 - Standards Applicable to Transporters of Hazardous Waste

E. NARA 40 CFR 264 - Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

F. NARA 40 CFR 265 - Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

G. NARA 40 CFR 266 - Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities

H. NARA 40 CFR 268 - Land Disposal Restrictions

I. NARA 40 CFR 270 - EPA Administered Permit Programs: The Hazardous Waste Permit Program

J. NARA 40 CFR 279 - Standards for the Management of Used Oil

K. NARA 40 CFR 300 - National Oil and Hazardous Substances Pollution Contingency Plan

L. NARA 40 CFR 302 - Designation, Reportable Quantities, and Notification

M. NARA 49 CFR 107 - Hazardous Materials Program Procedures

N. NARA 49 CFR 172 - Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

O. NARA 49 CFR 173 - Shippers - General Requirements for Shipments and Packaging

P. NARA 49 CFR 178 - Specifications for Packaging

## 1.03 PAYMENT

A. Separate payment will not be made for work performed under this Section. All costs associated with this Section shall be included in the unit or lump sum prices for the related Work.

## 1.04 CLASSIFICATION OF SOIL TRANSPORTATION AND DISPOSAL

A. Transportation and disposal shall be performed on a classified basis based on the results of the waste profile sampling, in accordance with the designations and classifications specified in Section 02300 EARTHWORK paragraph CLASSIFICATION OF EXCAVATION.

## 1.05 SUBMITTALS

A. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

1. Waste Management Plan: Prior to start of work, the Contractor shall submit a plan to the Owner detailing the manner in which on and off site hazardous wastes shall be managed for Owner approval.

a. On-Site Hazardous Waste Management Plan: The Contractor shall prepare a plan for submittal to the Owner detailing the manner in which hazardous wastes shall be managed and describing the types and volumes of hazardous wastes to be managed as well as the management practices to be utilized. The plan shall identify the method to be used to ensure accurate weights of shipments; shall propose facilities to be utilized for treatment, storage, and/or disposal; shall identify areas on-site where hazardous wastes are to be handled; shall identify whether transfer facilities are to be utilized; and if so, how the wastes shall be tracked to ultimate disposal.

b. Off-Site EPA Hazardous Waste Management Policy: The Contractor shall use RCRA Subtitle C permitted facilities which meet the requirements of 40 CFR 264 or facilities operating under interim status which meet the requirements of 40 CFR 265. In bid package Contractor must specify which disposal facilities (see pre approved facilities for use included in 3.08 DISPOSAL REQUIREMENTS, Section 02111 – Excavation and Handling of Contaminated Material). Off-site treatment, storage, and/or disposal facilities with significant RCRA violations or compliance problems (such as facilities known to be releasing hazardous constituents into ground water, surface water, soil, or air) shall not be used.

2. Qualifications and Certificates

a. Copies of the current certificates of registration issued to the Contractor and/or subcontractors.

b. EPA Off-Site Hazardous Waste Management Policy: A letter from the proposed disposal facility(s) certifying that EPA considers the facilities to be used for all off-site disposal to be acceptable in accordance with the Off-Site Rule in 40 CFR 300, Section 440.

3. Shipping Documents and Packaging Certification: The Contractor shall submit all transportation related shipping documents to the Owner, including hazardous waste manifests, bill of ladings for hazardous materials, lists of corresponding proposed labels, packages, marks, and placards to be used for shipment, waste profiles, supporting waste analysis documents, for review by Owner a minimum of 14 days prior to anticipated pickup.

4. Description of TSD Facility and Transporter: The Contractor shall provide the Owner with EPA ID numbers, names, locations, and telephone numbers of TSD facilities and transporters. This information shall be contained in the Hazardous Waste Management Plan for approval prior to waste disposal.

5. Transportation: The Contractor shall use manifests for transporting hazardous wastes as required by 40 CFR 263 or any applicable state or local law or regulation. Transportation shall comply with all requirements in the Department of Transportation referenced regulations in the 49 CFR series. The Contractor shall prepare hazardous waste manifests for each shipment of hazardous waste shipped off-site. Manifests and waste profiles shall be submitted to the Owner for review and approval.

## 1.06 QUALIFICATIONS

A. Transportation and Disposal Coordinator: The Contractor shall designate, by position and title, one person to act as the Transportation and Disposal Coordinator (TDC) for this contract. The TDC shall serve as the single point of contact for all environmental regulatory matters and shall have overall responsibility for total environmental compliance at the site including, but not limited to, accurate identification and classification of hazardous waste and hazardous materials; determination of proper shipping names; identification of marking, labeling, packaging and placarding requirements; completion of waste profiles, hazardous waste manifests, bill of ladings, exception and discrepancy reports; and all other environmental documentation. The TDC shall have, at a minimum, one year of specialized experience in the management and transportation of hazardous waste.

1. Certification: The Contractor and/or subcontractors transporting hazardous materials shall possess a current certificate of registration issued by the Research and Special Programs Administration (RSPA), U.S. Department of Transportation, when required by 49 CFR 107, Subpart G.

## 1.07 LAWS AND REGULATIONS REQUIREMENTS

A. Work shall meet or exceed the minimum requirements established by Federal, state, and local laws and regulations that are applicable. These requirements are amended frequently and the Contractor shall be responsible for complying with amendments as they become effective. In the event that compliance exceeds the scope of work or conflicts with specific requirements of the contract, the Contractor shall notify the Owner immediately.

## 1.08 SHIPPING, HANDLING, AND UNLOADING

A. General truck hauling requirements shall be in accordance with this section and Section 01355 ENVIRONMENTAL PROTECTION.

B. All loads shall be covered before leaving the Site and shall be free of loose debris.

# PART 2 PRODUCTS

## 2.01 MATERIALS

A. The Contractor shall provide all of the materials required for the packaging, labeling, marking, place carding, and transportation of hazardous wastes and hazardous materials in conformance with Department of Transportation standards. Details in this specification shall not be construed as establishing the limits of the Contractor's responsibility.

## 2.02 EQUIPMENT AND TOOLS

A. The Contractor shall provide miscellaneous equipment and tools necessary to handle hazardous materials and hazardous wastes in a safe and environmentally sound manner.

# PART 3 EXECUTION

## 3.01 LARGE HAUL DAY PROVISIONS

A. On days where the trucking operation is greater than 30 truck trips per day, the Contractor will provide an extra supervisor/flag-man who will be responsible to coordinate truck traffic through the Presidio.

## 3.02 HAZARDOUS MATERIALS MANAGEMENT

A. The Contractor, in consultation with the Owner, shall evaluate, prior to shipment of any material off-site, whether the material is regulated as a hazardous waste in addition to being regulated as a hazardous material; this shall be done for the purpose of determining proper shipping descriptions, marking requirements, etc., as described below.

B. Shipping Documents: The Contractor shall ensure that each shipment of hazardous material sent off-site is accompanied by properly completed shipping documents. Contractor shall organize, perform quality control and scan to electronic files all manifests. All manifests shall be submitted in paper and electronic (Adobe Acrobat PDF on compact disc) format for approval.

C. Other Hazardous Material Shipment Documents: The Contractor shall prepare a bill of lading for each shipment of hazardous material which is not accompanied by a hazardous waste manifest or asbestos waste shipment record which fulfills the shipping paper requirements. The bill of lading shall satisfy the requirements of 49 CFR 172, Subpart C, and any applicable state or local law or regulation, and shall be submitted to the Owner for review and approval. Bill of ladings requiring shipper's certifications will be signed by the Owner.

D. Contractor shall provide adequate personnel to monitor, direct, clean and count trucks.

E. Contaminated materials shall be disposed at an Owner approved off-site disposal facility as described in Section 02111 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL paragraph EXCAVATION OF CONTAMINATED MATERIAL.

## 3.03 EMERGENCY CONTACTS

A. The Contractor shall be responsible for complying with the emergency contact provisions in 49 CFR 172, Section 604. Whenever the Contractor ships hazardous materials, the Contractor shall provide a 24 hr emergency response contact and phone number of a person knowledgeable about the hazardous materials being shipped and who has comprehensive emergency response and incident mitigation information for that material, or has immediate access to a person who possesses such knowledge and information. The phone must be monitored on a 24 hour basis at all times when the hazardous materials are in transportation, including during storage incidental to transportation. The Contractor shall ensure that information regarding this emergency contact and phone number are placed on all hazardous material shipping documents. The Contractor shall designate an emergency on-site Health and Safety Officer and post the following information at areas in which hazardous wastes are managed:

1. The name of the on-site Health and Safety Officer.

2. Phone number through which the Health and Safety Officer can be contacted on a 24 hour basis.

3. The telephone number of the U.S. Park Police department is 415-561-5656.

4. The location of fire extinguishers and spill control materials.

## PART 4 MEASUREMENT AND PAYMENT

Not used.

**END OF SECTION**

# SECTION 02211

# UTILITY DECOMMISSIONING

## PART 1 GENERAL

### 1.01 GENERAL REQUIREMENTS

A. The Work consists of removal of water mains, sanitary sewer lines, storm drain lines, and gas lines within the footprint of the excavations and as depicted on the Contract Drawings. Further, the Contractor will also temporarily decommission lines as shown on the Contract Drawings during construction activities in accordance with this section. Rubbish and debris shall be removed from Presidio property daily, unless otherwise directed, to avoid accumulation at the Site.

### 1.02 SUBMITTALS

The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

A. Product Data

1. Sewer Plugs for the Sanitary Sewer Lines

2. Blind Flanges for the Water Lines

3. Grout Plugs for Storm Drain Lines

### 1.03 MAINTENANCE OF UTILITY SERVICE

A. Utility Service: Maintain existing utilities not for demolition or relocation. Protect existing utilities not indicated for demolition or relocation against damage during demolition operations. The Contractor shall verify existing utilities information and provide notifications in accordance with Section 01500 TEMPORARY CONSTRUCTION FACILITIES, paragraph LOCATION OF UNDERGROUND FACILITIES.

## 1.04 WORK SEQUENCING

A. For Decommissioning of Utility Lines, Contractor will follow the sequencing outlined on the following sheets:

| | | |
|---|---|---|
| 1. | Water: | C-110: Pre Construction Water Utility Plan |
| | | C-112: Building 231 Excavation Water Utility Plan |
| 2. | Sanitary Sewer: | C-117: Sanitary Sewer Utility Plan – South Area |
| 3. | Storm Drain: | C-113 and C-114 |

## 1.05 REGULATORY REQUIREMENTS

A. For gas line decommissioning, the Contractor will coordinate with PG&E to confirm procedures for decommissioning prior to initiating the fieldwork.

B. For water, sanitary, and storm drain lines decommissioning, the Contractor will coordinate with the Trust to confirm procedures for decommissioning prior to initiating the fieldwork.

# PART 2 PRODUCTS

## 2.01 WATER LINES

A. HPDE Lines: CSR Polypipe or Equivalent, Blind Flange with HDPE Adaptor.

B. Ductile Iron Lines: US Pipe, Mechanical Joint Blind Fitting.

## 2.02 SANITARY SEWER LINES

A. Sewer Plugs: Mechanical Pipe Plug (Stemar Equipment & Supply Co., Inc., Los Angeles, California (213) 625-0185)).

## 2.03 STORM DRAIN LINES

A. Grout Plugs – Non flowing and non shrink grout.

## PART 3 EXECUTION

### 3.01 PIPE CUTTING

A. Cutting of pipe shall be done in a neat and workman-like manner without damage to the pipe.

### 3.02 SEQUENCING

A. Contractor shall sequence the decommissioning work in accordance with the Work Sequencing outlined in 1.04: WORK SEQUENCING and detailed in the identified Contract Drawings.

### 3.03 UTILITY DECOMISSIONING

A. Contractor shall conduct the decommissioning, which includes the following and as detailed in the identified Contract Drawings:

1) Notify tenants as necessary prior to decommissioning and temporary disconnection of service.
2) Cut and cap water, sanitary sewer, gas, and storm drain lines at the locations shown on the contract drawings.
3) Remove utilities from within the foot-print of the excavation (see 3.04. REMOVAL OF UTILITIES WITHIN EXCAVATION FOOTPRINT).
4) Restore service to tenants as noted and in accordance with the sequence outlined in the Contract Drawings.

### 3.04 REMOVAL OF UTILITIES WITHIN EXCAVATION FOOTPRINT

A. Removal of Utilities– Where shown on the Contract Drawings, the Contractor will remove the water lines from within the footprints of the excavations. This removal will be done during excavation and not prior to excavation activities. Prior to removal, the Contractor shall follow the decommissioning procedures outlined in the Contract Drawings noted in 1.04: WORK SEQUENCING.

### 3.05 DISPOSITION OF MATERIAL

A. All materials encountered during the work are the Owner's property until relinquished by the Owner.

B. Historical, archaeological, or cultural items shall be handled according to SECTION 01355 ENVIRONMENTAL PROTECTION, Paragraph HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES.

## 3.06 ACM

A. Asbestos containing materials (ACM) shall be handled in accordance with Section 02111 EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS paragraph UNDERGROUND STORAGE TANKS, DRUMS AND ACM.

## 3.07 CLEANUP

A. Upon completion of the installation of water lines, and appurtenances, all debris and surplus materials resulting from the work shall be removed.

# PART 4 MEASUREMENT AND PAYMENT

## 4.1 MEASUREMENT

A. Decommission Storm Drain Utility unit of measure will be a lump sum.

B. Decommission Sanitary Sewer Utility unit of measure will be a lump sum.

C. Decommission Water Lines unit of measure will be a lump sum.

## 4.2 PAYMENT

A. Payment will be paid at lump sum prices stated in the Bid Schedule and shall be based on completed work performed in accordance with the Contract Documents. Separate payment will not be made for Work performed under this Section that does not include specific payment provisions. All non-itemized costs associated with this section shall be included in the lump sum price for the Work. Payment will constitute full compensation for all labor, equipment, tools, and incidentals necessary to complete the work.

1. Decommission Storm Drain Utility – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to decommission the storm drain and appurtenances in accordance with these specifications.

2. Decommission Sanitary Sewer Utility – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to decommission the sanitary sewer and appurtenances in accordance with these specifications.

3. Decommission Water Lines – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to decommission the water lines and appurtenances in accordance with these specifications.

**END OF SECTION**

# SECTION 02212

# UTILITY PROTECTION SYSTEM

## PART 1 GENERAL

### 1.01 GENERAL REQUIREMENTS

A. The Work consists of protecting in place the gas lines, located along the north face of Gorgas Avenue in place.

B. The Work consists of protecting in place the telecommunication lines in the Building 231 and 207 RUs.

### 1.02 SUBMITTALS

The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

A. As-Built Information on Gas Lines – Contractor shall conduct exploratory trenching along the gas line (plan view on the drawings) to determine the depth to the gas line and provide this information to the Engineer.

B. As-Built Information on Telecommunication Lines – Contractor shall conduct exploratory trenching along the telecommunication lines (plan view on the drawings) to determine the depth to the telecommunication lines and provide this information to the Engineer.

C. Work Plan for Protection of Telecommunication Lines – The Contractor shall provide the Engineer a plan for protection of the telecommunication lines. The plan shall provide means and methods to be used by the Contractor for protecting the lines.

## PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

### 3.01 EXPLORATORY TRENCHING – GAS LINE ON GORGAS

A. As-Built Information on Gas Lines – Contractor shall conduct exploratory trenching along the gas line (plan view on the drawings) to determine the depth to the gas line and provide this information to the Engineer. No separate payment to be made for this work.

### 3.02 PROTECTION OF GAS LINE ON GORGAS AVENUE

A. The Contract Drawings indicate that the sidewall of the excavations should be maintained at a minimum horizontal separation of 3 feet from the gas line running along Gorgas Avenue. However, it will be the Contractor's responsibility to ensure that the gas line is not damaged during excavation activities. No separate payment to be made for this work.

### 3.03 EXPLORATORY TRENCHING – TELECOMMUNICATION LINES

A. As-Built Information on Telecommunication Lines – Contractor shall conduct exploratory trenching along the telecommunication lines (plan view on the drawings) to determine the depth to the telecommunication lines and provide this information to the Engineer.

### 3.04 PROTECTION OF TELECOMMUNICATION LINES

A. The Contractor shall provide the Engineer a plan for protection of the telecommunication lines. The plan shall provide means and methods to be used by the Contractor for protecting the lines to allow for removal of impacted soil from underneath the lines. The Contractor shall deploy the approved protection plan in the field to safely execute excavation adjacent and underneath the telecommunication lines.

## PART 4 MEASUREMENT AND PAYMENT

### 4.01 MEASUREMENT

A. Protection for Telecommunication Lines unit of measure will be a lump sum.

B. Protection for 72-inch Storm Drain Line unit of measure will be a lump sum.

## 4.02 PAYMENT

A. Payment will be paid at lump sum prices stated in the Bid Schedule and shall be based on completed work performed in accordance with the Contract Documents. Separate payment will not be made for Work performed under this Section that does not include specific payment provisions. All non-itemized costs associated with this section shall be included in the lump sum price for the Work. Payment will constitute full compensation for all labor, equipment, tools, and incidentals necessary to complete the work.

1) Protection for Telecommunication Lines – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to protection of telecommunication lines and appurtenances in accordance with these specifications.

2) Protection for 72-inch Storm Drain Line – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to protection of the 72-inch storm drain line and appurtenances in accordance with these specifications.

**END OF SECTION**

# SECTION 02220

# DEMOLITION

## PART 1 GENERAL

### 1.01 REFERENCES

A. California Code of Regulations (CCR) Title 8, Section 1529 Asbestos in Construction

B. U.S. Occupational Safety and Health Administration (OSHA) Regulations (Standard - 29 CFR) Asbestos 1926.1101

C. OSHA Regulations (Standard - 29 CFR) 1926 Subpart T - Demolition

D. OSHA Regulations (Standard - 29 CFR) 1926.62.

### 1.02 SUMMARY

A. The work includes demolition of Building 231 foundation, removal of underground SVE piping and appurtenances within the excavation foot-print, saw cutting and removal of concrete and asphaltic concrete (AC). Rubbish and debris shall be removed from Presidio property daily, unless otherwise directed, to avoid accumulation at the Site. The historic structures within the area shall be protected. Exterior aspects of the existing buildings to remain shall be preserved and protected. Features indicated for removal and preservation shall be stored on site. Features demolished or dismantled shall be disposed as specified.

### 1.03 DUST CONTROL

A. The amount of dust resulting from demolition shall be controlled to prevent the spread of dust to occupied portions of the construction site and to avoid creation of a nuisance in the surrounding area. Use of water will not be permitted when it will result in, or create, hazardous or objectionable conditions such as ice, flooding and pollution or damage to structures.

### 1.04 PROTECTION

A. Protection of Personnel: The contractor shall comply with all requirements of OSHA Regulation 29 CFR 1926 Subpart T - Demolition. Additionally, before, during and after the demolition work, the Contractor shall continuously evaluate the area demolition is being performed in and take immediate action to protect all personnel working in and around the demolition site.

B. Protection of Existing Property and Structures: Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The Contractor shall take necessary precautions to avoid damage to existing items to remain in place; any damaged items shall be repaired or replaced as approved by the Owner. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required, including the protection of historical structures, performed under this contract.

C. Environmental Protection: The work shall comply with the requirements of Section 01355 ENVIRONMENTAL PROTECTION.

D. Utility Service: Maintain existing utilities not for demolition or relocation. Protect existing utilities not indicated for demolition or relocation against damage during demolition operations. The Contractor shall verify existing utilities information and provide notifications in accordance with Section 01500 TEMPORARY CONSTRUCTION FACILITIES, paragraph LOCATION OF UNDERGROUND FACILITIES.

## 1.05 EXISTING STRUCTURES

A. Existing structures are shown in the Contract Drawings; locations are approximate and shall be verified by the Contractor prior to Construction.

## 1.06 BURNING

A. The use of burning at the project site for the disposal of refuse and debris will not be permitted.

## 1.07 USE OF EXPLOSIVES

A. Use of explosives will not be permitted.

# PART 2 PRODUCTS

Not used.

## PART 3 EXECUTION

### 3.01 EXISTING FACILITIES TO BE REMOVED

A. Building Foundation: Remove foundation of Building 231 and dispose off-site.

B. Pavements: Saw asphalt and concrete along straight lines to full depth of pavement and remove.

C. Patching: Where removals leave holes and damaged surfaces exposed in the finished work, patch and repair these holes and damaged surfaces to match adjacent finished surfaces. Where new work is to be applied to existing surfaces, perform removals and patching in a manner to produce surfaces suitable for receiving new work. Finished surfaces of patched area shall be flush with the adjacent existing surface and shall match the existing adjacent surface as closely as possible as to texture and finish. Patching shall be as specified and indicated, and shall include:

1. Holes and depressions caused by previous physical damage or left as a result of removals in existing concrete to remain shall be completely filled with an approved patching material, applied in accordance with the manufacturer's printed instructions.

### 3.02 DISPOSITION OF MATERIAL

A. All materials encountered during the work are the Owner’s property until relinquished by the Owner.

B. Historical, archaeological, or cultural items shall be handled according to SECTION 01355 ENVIRONMENTAL PROTECTION, Paragraph HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES.

### 3.03 UNDERGROUND STORAGE TANKS, DRUMS AND ACM

A. Underground storage tank (USTs), associated piping, drums or other containers and asbestos containing materials (ACM) shall be handled in accordance with Section 02111 EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS paragraph UNDERGROUND STORAGE TANKS, DRUMS AND ACM.

### 3.04 UNEXPLODED ORDNANCE

A. Unexploded ordnance shall be handled in accordance with Section 02111 EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS paragraph UNEXPLODED ORDNANCE.

## 3.05 CLEAN UP

A. Debris and rubbish shall be removed from the work area. Debris shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Local regulations regarding hauling and disposal shall apply. Contractor shall surface-clean trucks transporting debris offsite for disposal before leaving the site using dry methods (such as a broom). No wet washing of tires is anticipated. Contractor shall cover truck loads from the point of departure at the site to the disposal landfill. It is unacceptable for waste or potentially contaminated material to be tracked by truck tires offsite.

The Contractor will be responsible to keep the streets clean. If the Contractor does not clean the streets in a timely manner, the Trust reserves the right to clean streets of waste caused by trucks leaving the site and bill the Contractor for the cost of street cleaning.

.B. Active erosion protection measures may be left in place upon approval by the Owner after clean-up.

## 3.06 DISPOSAL OF REMOVED MATERIALS

A. Dispose of debris, rubbish, scrap, and other materials resulting from removal operations in accordance with all applicable federal, state and local regulations. Removed materials shall not be stored on the project site.

# PART 4 MEASUREMENT AND PAYMENT

The Contractor shall use sheets C-106 and C-107 for the definition of limits of work.

## 4.01 MEASUREMENT

A. Removal of Underground SVE Piping and Appurtenances unit of measure will be a lump sum.

B. Demolition of Building 231 Slab unit of measure will be square foot of slab removed.

C. Demolition of Building 230 RU AC Pavement unit of measure will be square foot of pavement removed.

D. Demolition of Building 38 RU AC Pavement unit of measure will be square foot of pavement removed.

E. Demolition of Building 207 RU AC Pavement unit of measure will be square foot of pavement removed.

F. Demolition of Building 231 RU AC Pavement unit of measure will be square foot of pavement removed.

G. Demolition of Sidewalk on Mason Street unit of measure will be square foot of pavement removed.

## 4.02 PAYMENT

A. Payment will be paid at lump sum or unit prices stated in the Bid Schedule and shall be based on completed work performed in accordance with the Contract Documents. Separate payment will not be made for Work performed under this Section that does not include specific payment provisions. All non-itemized costs associated with this section shall be included in the lump sum or unit price for the Work. Payment will constitute full compensation for all labor, equipment, tools, and incidentals necessary to complete the work.

1) Removal of underground SVE Piping and Appurtenances – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to remove the SVE Piping and appurtenances and stockpile it in accordance with these specifications.

2) Demolition of Building 231 Slab – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to demolish the Building 231 slab and stockpile it in accordance with these specifications.

3) Demolition of Building 230 RU AC Pavement – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to demolish the Building 230 RU AC pavement and stockpile it in accordance with these specifications.

4) Demolition of Building 38 RU AC Pavement – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to demolish the Building 38 RU AC pavement and stockpile it in accordance with these specifications.

5) Demolition of Building 207 RU AC Pavement – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to demolish the Building 207 RU AC pavement and stockpile it in accordance with these specifications.

6) Demolition of Building 231RU AC Pavement – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to demolish the Building 231 RU AC pavement and stockpile it in accordance with these specifications.

7) Demolition of Sidewalk on Mason Street – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to demolish the sidewalk on Mason Street and stockpile it in accordance with these specifications.

**END OF SECTION**

# SECTION 02240

# DEWATERING AND WATER DISPOSAL

## PART 1 GENERAL

### 1.01 REFERENCES

A. Trust Industrial Waste Water Discharge Permit - Class II Wastewater Permit No. 05-0246 issued by the San Francisco Department of Public Works.

### 1.02 SUMMARY

A. Work includes installation of dewatering of excavations and utility trenches as required. Dewatering rates of no more than 5 gallons per minute, thrash pumps to transfer water from dewatering wells/trenches to two 21,000 gallon baker tanks, and discharge to the Trust's sanitary sewer system.

### 1.03 DEWATERING WORK

A. Removal of groundwater or surface water that enters the excavations, as needed. For PCB-impacted water from the southeastern portion of Building 231, PCB contaminated groundwater will be conveyed to a 500 gallon tank. The remaining water from the excavations and trenches shall be pumped out and conveyed to two 21,000 gallon baker tanks (or equivalent), to be placed at the location shown on Sheet C-103. The dewatering system shall be designed and operated to maintain a safe construction site and allow Owner access to excavation sidewalls and bottom for confirmation sampling.

B. Sampling and analysis of water collected in the tank(s) will be performed by the Engineer as described in Section 01355 ENVIRONMENTAL PROTECTION. Waste water shall be disposed of as directed by Owner. Provided the waste water analytical data meets the Trust's industrial wastewater discharge permit, the waste water will be discharged to the sanitary sewer system through a manhole, located between the northern and southern Doyle Drive overpasses, depicted on Figure 1-2 of the Work Plan. The Contractor shall obtain authorization from the Owner prior to discharge. The Contractor will pump the water from the collection tanks to the sanitary sewer with a high pressure rated fire hose.

### 1.04 LOCATION

A. The excavations/trenches that may require dewatering are shown on the Contract Drawings.

## 1.05 EXISTING SITE CONDITIONS

A Contaminants in Groundwater

1. See Sheets C-104 and C-105 for contaminants of concern and corresponding concentrations in groundwater.

## 1.06 SAMPLING AND MONITORING

A. The Contractor will maintain accurate logs of volume of water extracted, period of extraction, extraction flow rates during the operation of the dewatering system.

B. The Contractor shall manage water storage and perform discharge as directed by the Owner. The Contractor shall assist the Owner with water sampling and analysis per the requirements of Section 01355 ENVIRONMENTAL PROTECTION.

## 1.07 SCHEDULING

A. The Contractor shall notify the Owner 5 calendar days prior to the start of dewatering.

# PART 2 PRODUCTS

## 2.01 SPILL RESPONSE MATERIALS

A. The Contractor shall provide appropriate spill response materials including, but not limited to the following: containers, adsorbents, shovels, and personal protective equipment. The Contractor shall maintain the appropriate types and amount of spill response materials at the Site to handle the anticipated materials, wastes and contaminants at the Site. Spill response materials shall be available at all times when contaminated materials/wastes are being stored, handled or transported. Spill response materials shall be compatible with the type of materials and contaminants. The Contractor shall include an inventory of the spill response materials being provided in the Contractor Environmental Protection Plan-Spill Control Plan submittal described in Section 01355 ENVIRONMENTAL PROTECTION.

## PART 3 EXECUTION

### 3.01 PROTECTION

A. Surface water, including rainfall and related runoff, shall be diverted to prevent entry into the excavation. Dewatering shall be limited to that necessary to assure adequate access for construction and confirmation sampling, a safe excavation, and prevent the spread of contamination.

### 3.02 EXECUTION

A. Contractor shall provide labor, equipment, and materials to maintain the dewatering system fully functional during the excavation activities.

B. Contractor shall maintain accurate logs of volume of water extracted, period of extraction, extraction flow rates during the operation of the dewatering system.

### 3.03 WASTE PROFILING

A. Contractor shall assist Owner with waste water sample collection from collection tanks. Samples will be collected and analyzed by the Owner in accordance with Section 01355 ENVIRONMENTAL PROTECTION.

### 3.04 SPILLS OF HAZARDOUS SUBSTANCES

A. In the event of a spill or release of a hazardous substance (as designated in 40 CFR 302), pollutant, contaminant, or oil (as governed by the Oil Pollution Act (OPA), 33 U.S.C. 2701 et seq.), the Contractor shall notify the Owner immediately. Immediate containment actions shall be taken to minimize the effect of any spill or leak. Cleanup shall be in accordance with applicable federal, state, and local regulations. As directed by the Owner, additional sampling and testing shall be performed to verify spills have been cleaned up. Spill cleanup and testing shall be done at no additional cost to the Owner.

### 3.05 DISCHARGE OF PCB CONTAMINATED WATER

A. Do not discharge any water until tests results showing water is below PCB contaminated water limits as specified herein. PCB contaminated water exceeding reporting limits is reported in two groundwater samples, 231GW01 and 231GW112, both of which are located in the southeast portion of Building 231, which will demolished prior to excavation. Water from this area will be transferred to a 500 gallon poly tank, which will be tested for PCB (by EPA Method 8081 in addition to the analytes listed in Permit No. 05-0246, Industrial User Class II wastewater permit. If PCB concentrations exceed the limits identified in this section, then it will be

discharged in accordance with 3.06, TRANSPORTATION AND DISPOSAL presented in Section 13285, Removal and Disposal of PCB Contaminated Soils. Otherwise, it will be discharged to the Trust's sanitary sewer system, pending compliance with the Trust's Wastewater Discharge Permit.

## 3.06 DISCHARGE OF REMAINING EXTRACTED GROUNDWATER

A. Only discharge extracted groundwater to the Trust's sanitary sewer system, if the analytical results in the samples collected confirm compliance with the Trust's Wastewater Discharge permit.

## 3.07 GROUNDWATER STORAGE AND TREATMENT

A. If samples collected from water extracted from the excavation do not satisfy the required discharge limits for disposal in the Presidio Sanitary Sewer System as defined in Section 01355 ENVIRONMENTAL PROTECTION, the Contractor shall coordinate with the Owner to treat or dispose the material off-site.

B. Secondary Containment of Water Storage Tanks: The Baker Tanks to be used on the project will be placed on secondary containment berms. These berms will be chemically resistant polyethylene liner material and will have a minimum floor thickness of 60 mil and sidewall thickness of 40 mil.

### WORK RESTRICTIONS

A. Dewatering will only be conducted when the Contractor is on site. In the event of a spill from the storage tank(s), the Contractor will contain the spill using the spill containment kits.

# PART 4 MEASUREMENT AND PAYMENT

## 4.01 MEASUREMENT

A. Dewatering unit of measurement will be the lump sum. Contractor shall provide a full list of materials and equipment to be used for the dewatering system installation and operation.

## 4.02 PAYMENT

A. Payment will be on a lump sum basis for the Dewatering System Installation and Operation. Payment will constitute full compensation for all labor, equipment, tools, and incidentals necessary to install the system, operate the system, as necessary, during excavation activities, assist the Engineer in collecting samples from the collection tanks, coordinate with the Owner to obtain permission for

discharge of groundwater to the sanitary sewer and discharge the water from the collection tanks to the sanitary sewer in accordance with the Trust's industrial wastewater discharge permit. Sanitary sewer fees will be paid by the Owner.

**END OF SECTION**

# SECTION 02300

# EARTHWORK

## PART 1 GENERAL

### 1.01 REFERENCES

A. ASTM D 1557 - (1991; R 1998) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu. m.))

B. ASTM D 2487 - (2000) Classification of Soils for Engineering Purposes (Unified Soil Classification System)

C. ASTM D 2922 - (1996 el) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

D. ASTM D 3017 - (1988; R 1996 el) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

E. Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1926 Section 650

F. Regional Water Quality Control Board (RWQCB) Order R2-2003-0080 Site Clean Up Requirements

G. Department of Toxic Substances Control (DTSC) Information Advisory Clean Imported Fill Material (*DTSC, 2001*)

### 1.02 DEFINITIONS

A. Import Fill: Material in accordance with the specifications provided in 2.01 IMPORT FILL product specifications.

B. Degree of Compaction: Degree of compaction required is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557.

C. Unsatisfactory Materials: Materials that do not comply with the requirements for satisfactory materials are unsatisfactory. Unsatisfactory materials also include man-made fills; unstable materials; trash; refuse; backfills from previous construction; and material classified as satisfactory which contains root and other organic matter or frozen material. The Owner shall be notified of any contaminated materials.

## 1.03 SUBMITTALS

A. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

1. Waybills and shipping documentation: Copies of waybills during the progress of the work. Certified waybills shall be provided prior to submission of the request for payment for items requiring waybills.

2. Import Fill Material Grain Size Distribution Data in accordance with these specifications (see 2.01 IMPORT FILL of this section).

3. Geotechnical Test Data (Dry Density vs. Moisture Content) curves for import fill material proposed for use by Contractor.

## 1.04 SUBSURFACE DATA

A. Investigation reports may be examined at the Presidio Trust library; 34 Graham Street upon request. These data represent the subsurface information available; however, variations may exist in the subsurface between boring locations. The project involves removal of soil and debris.

## 1.05 CLASSIFICATION OF EXCAVATION

A. Excavation specified shall be done on a classified basis, in accordance with the following designations and classifications.

1. Excavation – Class III: Material designated as inert debris and soil shall be disposed offsite at an approved permitted Class III disposal facility.

2. Excavation – Class II: Contaminated material that requires disposal at a Class II disposal facility shall be disposed offsite at an approved permitted Class II disposal facility.

3. Excavation – Class I: Contaminated material that requires disposal at a Class I disposal facility shall be disposed offsite at an approved permitted Class I disposal facility.

4. Excavation of large concrete debris with a diameter or length greater than approximately 2 feet shall be stockpiled, broom cleaned and recycled at an approved recycling facility.

## 1.06 REQUIREMENTS FOR IMPORT SOIL

A. The Contractor shall coordinate with the Owner to identify potential sources for imported soil. Contractor shall be responsible for identification of acceptable import soil sources. Import fill grain size distribution shall be in accordance with these specifications and will be naturally derived (see 2.01 IMPORT FILL of this section for grain size specifications and Attachment 2 of these specifications for examples of suitable material).

B. Soils identified for import by the Contractor will be tested by the Owner for chemicals listed in Table 02300-1 in accordance with the frequency listed in Table 02300-2 and criteria listed in Table 02300-3. Contractor shall coordinate with the Owner to perform collection of import soil samples for analysis at the material source. Concentrations of chemicals shall not exceed cleanup levels presented on Table 02300-1 and in RWQCB Order R2-2003-0080 *Site Clean Up Requirements*. The Contractor shall allow up to two weeks for import soil sample analysis and review. The Contractor shall assist the Owner as directed to collect soil samples. Owner reserves the right to reject import soil for any reason.

C. The top 18 inches of backfill used in areas that are paved with asphalt or concrete shall not contain total petroleum hydrocarbon as gasoline (TPHg) at concentrations greater than 11.6 milligrams per kilogram (mg/kg), TPH as diesel (TPHd) at concentrations greater than 115 mg/kg and TPH as motor oil (TPHmo) at concentrations greater than 144 mg/kg. Concentrations of all other analytes shall comply with Table 02300-1. The top 18 inches of backfill in areas that are not paved shall contain no detectable concentrations (i.e., non detect as defined by Practical Quantitation Limits (PQL) for the analytical method specified) of the fuel constituents and be below the cleanup levels listed for other chemicals of concern in Table 02300-1.

D. Import fill soil shall be virgin material free of seeds and propagules.

**TABLE 02300-1**
**IMPORT SOIL SAMPLE ANALYSIS REQUIREMENTS**

| Chemical | Cleanup Level (mg/kg) |
|---|---|
| **Total Petroleum Hydrocarbons (TPH)** | |
| TPH (as gasoline) | 11.6 |
| TPH (as diesel) | 115 |
| TPH (as fuel oil) | 144 |
| **PAHs** | |
| Acenaphthene | 0.31 |
| Acenaphthylene | 0.067 |
| Anthracene | 0.45 |
| Benzo(a)anthracene | 0.27 |
| Benzo(a)pyrene | 0.027 |
| Benzo(b)fluoranthene | 0.27 |
| Benzo(g,h,i)perylene | 0.25 |
| Benzo(k)fluoranthene | 0.27 |
| Chrysene | 0.67 |
| Dibenzo(a,h)anthracene | 0.071 |
| Fluoranthene | 1.5 |
| Fluorene | 0.28 |
| Indeno(1,2,3-c,d)pyrene | 0.26 |
| Naphthalene | 0.3 |
| Phenanthrene | 0.61 |
| Pyrene | 0.79 |
| Total PAHs | 5.6 |
| **VOCs** | |
| Acetone | 0.24 |
| Benzene | 0.005 |
| Bromodichloromethane[1] | 0.012 |
| Bromoform[1] | 2.2 |
| Bromomethane[1] | 0.22 |
| 2-Hexanone (MBK) [1] | 2.7 |
| Carbon disulfide | 200 |
| Carbon tetrachloride[1] | 0.012 |
| Chlorobenzene[1] | 1.5 |
| Dibromochloromethane[1] | 0.019 |
| Chloroethane[1] | 0.63 |
| 2-Chloroethyl vinyl ether[1] | -- |
| Chloroform[1] | 0.098 |

**TABLE 02300-1**
**IMPORT SOIL SAMPLE ANALYSIS REQUIREMENTS**

| Chemical | Cleanup Level (mg/kg) |
|---|---|
| Chloromethane | 0.19 |
| 1-1-Dichloroethane[1] | 0.2 |
| 1,2-Dichloroethane[1] | 0.0045 |
| cis-1,2-Dichloroethene | 0.19 |
| trans-1,2-Dichloroethene[1] | 0.67 |
| 1,2-Dichloropropane[1] | 0.052 |
| cis-1,3-dichloropropene[1] | 0.033 |
| trans-1,3-dichloropropene[1] | 0.033 |
| Ethylbenzene[2] | 0.005* |
| 2-Butanone (MEK) [1] | 3.8 |
| Methylene chloride | 0.076 |
| Methyl-tert butyl ether | 0.023 |
| 4-Methyl-2-pentanone (MIBK) [1] | 2.7 |
| Styrene[1] | 1.5 |
| 1,1,2,2-Tetrachloroethane[1] | 0.009 |
| Tetrachloroethene | 0.087 |
| Toluene[2] | 0.005* |
| 1,1,1-Trichloroethane[1] | 8 |
| 1,1,2-Trichloroethane[1] | 0.033 |
| Trichloroethene | 0.26 |
| Vinyl acetate[1] | 430 |
| Vinyl chloride[1] | 0.0067 |
| Total Xylenes[2] | 0.005* |
| | |
| **Metals** | |
| Aluminum | 76,000 |
| Antimony[1] | 29 |
| Arsenic[2] | 0.36 |
| Barium | 320 |
| Beryllium | 10 |
| Cadmium[1] | 1.7 |
| Calcium | -- |
| Chromium | 140 |
| Cobalt | 21 |
| Copper | 49 |
| Cyanide | 1,000 |
| Iron | 23,000 |
| Lead | 50 |
| Magnesium | -- |
| Manganese | 1,800 |

**TABLE 02300-1**
**IMPORT SOIL SAMPLE ANALYSIS REQUIREMENTS**

| **Chemical** | **Cleanup Level (mg/kg)** |
|---|---|
| Mercury | 20 |
| Molybdenum[1] | -- |
| Nickel | 110 |
| Potassium | -- |
| Selenium[1] | 0.5 |
| Silver | 1 |
| Sodium | -- |
| Thallium[1] | 1.0 |
| Vanadium | 90 |
| Zinc | 60 |

Note:
mg/kg = Milligrams per kilogram.
-- = For chemicals with no cleanup levels, there are no Presidio cleanup levels, RWQCB ESLs, or USEPA PRGs.

[1]= Clean up level for these constituents from the California Regional Water Quality Control Board, San Francisco Bay Region, Order No. R2-2003-0080 (because CAP does not have a cleanup level).

[2]= Cleanup level based on California Regional Water Quality Control Board, San Francisco Bay Region, Order No. R2-2003-0088 (because level in this order is lower than Site-specific cleanup level).

Source of Table: Corrective Action Plan, Building 207/231 Area, Presidio of San Francisco. (*MACTEC, 2007c*)

| **TABLE 02300-2<br>IMPORT SOIL SAMPLE FREQUENCY** | |
|---|---|
| **Area of Individual Borrow Area** | **Sampling Requirements** |
| 2 acres or less | Minimum of 4 samples |
| 2 to 4 acres | Minimum of 1 sample every 1/2 acre |
| 4 to 10 acres | Minimum of 8 samples |
| Greater than 10 acres | Minimum of 8 locations with 4 sub-samples per location |
| | |
| **Volume of Borrow Area Stockpile** | **Samples per Volume** |
| Up to 1,000 cubic yards | 1 sample per 250 cubic yards |
| 1,000 to 5,000 cubic yards | 4 samples for first 1000 cubic yards +1 sample per each additional 500 cubic yards |
| Greater than 5,000 cubic yards | 12 samples for first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards |
| Source of Table: Department of Toxic Substances Control (DTSC) Information Advisory Clean Imported Fill Material (*DTSC, 2001*) | |

| **TABLE 02300-3<br>POTENTIAL CONTAMINANTS BASED ON THE FILL SOURCE AREA** | |
|---|---|
| **Fill Source** | **Target Compounds** |
| Land near an existing freeway | Lead (EPA methods 6010B or 7471A), PAHs (EPA method 8310) |
| Land near a mining area or rock quarry | Heavy Metals (EPA methods 6010B and 7471A), asbestos (polarized light microscopy), pH |
| Agriculture land | Pesticides (Organochlorine Pesticides; EPA method 8081A or 8080A; Organophosphorous Pesticides; EPA method 8141A; Chlorinated Herbicides; EPA method 8151A), heavy metals (EPA methods 6010B and 7471A) |

| **TABLE 02300-3<br>POTENTIAL CONTAMINANTS BASED ON THE FILL SOURCE AREA** | |
|---|---|
| **Fill Source** | **Target Compounds** |
| Residential/acceptable commercial land | VOCs (EPA method 8021 or 8260B, as appropriate and combined with collection by EPA Method 5053), semi-VOCs (EPA method 8270C), TPH as gasoline, diesel, and fuel oil (modified EPA 8015), PCBs (EPA method 8082 or 8080A), heavy metals including lead (EPA methods 6010B and 7471A) asbestos (OSHA Method ID-191) Silica gel laboratory preparation (EPA Method 3630A) is required for TPH as diesel and TPH as fuel oil analyses. |
| The above analyses shall be performed in accordance with USEPA SW-846 methods (1996). Other possible analyses include Hexavalent Chromium; EPA method 7199: Source of Table: Department of Toxic Substances Control (DTSC) Information Advisory Clean Imported Fill Material (*DTSC, 2001*) | |

E. Import fill grain size distribution shall be in accordance with these specifications and will be naturally derived (see 2.01 IMPORT FILL of this section for grain size specifications and Attachment 2 of these specifications for examples of suitable material).

## PART 2 PRODUCTS

### 2.01 IMPORT FILL

A. Import fill shall be used for backfill as specified and indicated on the Drawings. Import fill soil shall be utilized to supplement onsite excavated borrow materials as required. The material shall meet the grain size distribution requirements listed below, the specifications in Attachment 2, and the chemical analytical requirements of Table 02300-1. Only natural sand will be allowed for use by the Contractor (e.g., Quail Hollow Quarry, Felton, CA, Phone No.: 405 Quail Hollow Road, Felton, CA 95018-9424). See Attachment 2 for an example of the natural sand available at the Quail Hollow Quarry site.

**TABLE: CUMULATIVE PERCENT PASSING**

| Sieve Size | Percent Passing |
|---|---|
| ½" | 100 |
| No. 4 | 75-100 |
| No. 8 | 70-100 |
| No. 16 | 65-100 |
| No. 30 | 60-100 |
| No. 50 | 40-70 |
| No. 100 | 0-30 |
| No. 200 | 0-15 |

Sand Equivalent – Equal to or Greater than 20
pH – Greater than 4.5 but less than 9.0
Chloride Content – Less than or Equal to 500 ppm
Sulfate Content – Less than or Equal to 150 ppm

## PART 3 EXECUTION

### 3.01 EXCAVATION

A. Excavation shall be performed in accordance with applicable provisions of this Section and Section 02111 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL. The Contractor shall include in the Construction Procedures Plan a description of the proposed excavation methods for performing the excavations. The Construction Procedures Plan shall also include a proposed schedule for performing the excavations that includes time associated with soil sample collection, analysis and review. The Contractor shall perform excavation of every type of material encountered within the limits of the project to the lines indicated, as specified and as directed by the Owner. Excavated materials shall be loaded directly to trucks for offsite disposal or stockpiled onsite prior to loading.

B. The Contractor shall perform an Excavation Record Survey of the completed excavation as specified in Section 01720 FIELD SURVEYS AND CONTROL.

### 3.02 VISUAL GEOTEXTILE MARKER FOR EXCAVATION

If excavations are terminated before cleanup levels are met, the Contractor will install a visual subsurface marker (such as a permeable geotextile material) to identify the extent of the excavation. Mirafi 170N (or equivalent) geotextile marker will be used for this purpose.

## 3.03 BACKFILL

A. Backfill shall be performed after the Owner has completed analysis of excavation confirmation soil sample analytical results and directed the Contractor to proceed with backfill. The Contractor shall allow up to two weeks of standby time for soil sample analysis and review.

B. Backfill compaction specifications will be as follows.

| **Type of Backfill** | **Soil Type** | **Compaction Criteria** |
|---|---|---|
| Backfill to Final Surface – Building 231 RU (Except Gorgas Avenue), Landscape Portions of Building 38 RU and 207 RU | Natural Sand | No Compactive Effort |
| Backfill to Bottom of Subgrade – Gorgas Avenue and Parking Lot Portions of Building 38 RU, Building 230 RU, and Building 207 RU | Natural Sand | 90% Minimum, 1 test for each 8-inch loose lift, 100 square yards |
| Utility Trench to Surface– Building 231 RU (Except Gorgas Avenue), Landscape Portions of Building 38 RU and 207 RU | Natural Sand | 90% Minimum, 1 test for each 8-inch loose lift, 100 foot of Trench |
| Utility Trench to Bottom of Subgrade– Gorgas Avenue and Parking Lot Portions of Building 38 RU, Building 230 RU, and Building 207 RU | Natural Sand | 90% Minimum,1 test for each 8-inch loose lift, 100 foot of Trench |
| Subgrade Below Pavement | Class II – Aggregate Base | 95% Minimum, 1 test for 8-inch loose lift, 100 square yards |

C. Imported material shall be placed as indicated on the Contract Drawings and per these specifications.

D. Contractor shall perform Intermediate Backfill Surveys and a Final Record Survey as specified in Section 01720 FIELD SURVEY AND CONTROLS.

## 3.04 SUBGRADE PREPARATION FOR PAVEMENT

A. Construction: Subgrade shall be shaped to line, grade and compacted as specified. This operation shall include plowing, disking, and any moistening or aerating required to obtain specified compaction. Soft or otherwise unsatisfactory material shall be removed and replaced with satisfactory excavated material or other approved material as directed. Low areas resulting from removal of unsatisfactory material or excavation of rock shall be brought up to required grade with satisfactory materials, and the entire subgrade shall be shaped to line, grade, and cross section and compacted as specified. The elevation of the finished subgrade shall not vary more than 0.1 foot from the indicated grade.

B. Compaction: Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment in 8 inch loose lifts. Each layer of the fill shall be compacted to at least 95 percent (%) of laboratory maximum density (i.e., only for aggregate base for pavement areas). Below the AB for natural sand, compaction will be at 90% of laboratory maximum density.

## 3.05 PROTECTION

A. Protection Systems: Provide shoring, bracing, cribbing, underpinning, and sheeting, except that banks may be sloped when approved by the Owner. If workers must enter the excavation, it shall be evaluated, shored, sloped, or braced as required by 29 CFR 1926 Section 650. If shoring is greater than 20 feet in depth it shall be designed by a state of California registered Civil Engineer.

B. Drainage and Dewatering: Provide for the collection and disposal of surface and subsurface water encountered during construction per Section 01355 ENVIRONMENTAL PROTECTION and Section 02111 EXCAVATION AND HANDLING OF HAZARDOUS MATERIALS.

C. Drainage: Maintain drainage of construction site to keep soil materials sufficiently dry. The Contractor shall grade the construction area to provide positive surface water runoff away from the construction activity and/or provide temporary ditches, swales, and other drainage features and equipment as required to maintain dry soils. Contractor shall be responsible for assessment of the soil and ground water conditions to employ necessary measures to permit construction to proceed.

D. Dewatering: Groundwater flowing toward or into excavations shall be controlled to prevent sloughing of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. French drains, sumps, ditches or trenches will not be permitted within 3 feet of the foundation of any structure, except with specific written approval, and after specific contractual provisions for restoration of the foundation area have been made.

Control measures shall be taken by the time the excavation reaches the water level in order to maintain the integrity of the in situ material.

1. Operate dewatering system as needed until construction work below existing water level is complete.

## 3.06 TESTING

A. Geotechnical testing of backfill material shall be the responsibility of the Contractor and be performed at no additional cost to the Owner. Contractor shall assist with chemical testing of backfill material performed by the Owner in accordance with paragraph REQUIREMENTS FOR IMPORTED SOIL.

1. Testing Facilities

a. Tests shall be performed by an Owner approved state certified commercial testing laboratory. No work requiring testing will be permitted until the facilities have been approved by the Owner.

2. Geotechnical testing of Backfill Materials

a. Classification of backfill materials shall be determined in accordance with ASTM D 2487 and moisture-density relations of soils ASTM D 1557. A minimum of one soil classification and one moisture-density relation test shall be performed on each different type of material used for backfill.

B. Field Density Tests

1. Tests shall be performed in sufficient numbers to ensure that the specified density is being obtained. A minimum of one field density test per lift of backfill shall be performed (see 3.03, Backfill for size of lift). One moisture density relationship shall be determined for every 1500 cubic yards of material used. Field in-place density shall be determined in accordance with ASTM D 2922. When ASTM D 2922 is used, the calibration curves shall be checked and adjusted using the sand cone method as described in paragraph Calibration of the ASTM publication. ASTM D 2922 results in a wet unit weight of soil and when using this method, ASTM D 3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gauges shall be checked along with density calibration checks as described in ASTM D 3017. The calibration checks of both the density and moisture gauges shall be made at the beginning of a job, on each different type of material encountered, at intervals as directed by the Owner. Copies of calibration curves, results of calibration tests, and field and laboratory density tests

shall be furnished to the Owner. Excavations improperly compacted shall be reopened to the depth directed, then refilled and compacted to the density specified at no additional cost to the Owner.

## 3.07 FINISHING

A. The surface of excavations shall be finished to a uniform surface to collect water at a single location.

## 3.08 UNDERGROUND STORAGE TANKS, DRUMS AND ACM

A. Underground storage tank (USTs), associated piping, drums or other containers and asbestos containing materials (ACM) shall be handled in accordance with Section 02111 EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS paragraph UNDERGROUND STORAGE TANKS, DRUMS AND ACM.

## 3.09 UNEXPLODED ORDNANCE

A. Unexploded ordnance shall be handled in accordance with Section 02111 EXCAVATION AND HANDLING OF CONTAMINATED MATERIALS paragraph UNEXPLODED ORDNANCE.

# PART 4 MEASUREMENT AND PAYMENT

## 4.01 MEASUREMENT

A. Backfilling of RU Excavations will be on a per ton basis. The measurement will not include material that is transported without authorization. Copies of certified waybills from the quarry source shall be submitted to document acceptable payment quantities. Weigh tickets shall include printout that includes the quarry source name, time, date, truck number, and weight. Weighing shall be performed on accurately calibrated scales.

## 4.02 PAYMENT

A. Payment will be on a per ton basis for the Backfilling of RU Excavations. Payment will constitute full compensation for all labor, equipment, tools, and incidentals necessary to backfill the RU excavations in accordance with these specifications.

**END OF SECTION**

# SECTION 02316

# EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITY SYSTEMS

## PART 1 GENERAL

### 1.01 REFERENCES

A. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) D 422 - (1963; R 1990) Particle-Size Analysis of Soils

B. ASTM D 1557 - (1991) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu. m.))

C. ASTM D 2487 - (1998) Classification of Soils for Engineering Purposes (Unified Soil Classification System)

D. ASTM D 2922 - (1996) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

E. ASTM D 3017 - (1988; R1996el) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

### 1.02 PAYMENT

A. Separate payment will not be made for work performed under this Section. All costs associated with this Section shall be included in the unit or lump sum prices for the related Work.

### 1.03 SUBMITTALS

A. The following shall be submitted in accordance with Section 01300 SUBMITTALS:

1. Test reports: Import and borrow site testing reports for Owner approval as described in Section 02300 EARTHWORK.

### 1.04 DEFINITIONS

A. Import Fill: Material in accordance with the specifications provided in 2.01 IMPORT FILL product specifications of Section 02300: Earthwork.

B. Unsatisfactory Materials are materials that do not comply with the requirements for satisfactory materials are unsatisfactory. Unsatisfactory materials also include

man-made fills, trash, refuse, or backfills from previous construction. Unsatisfactory material also includes material classified as satisfactory that contains root and other organic matter, frozen material, and stones larger than 3 inches. The Owner shall be notified of any contaminated materials.

C. Unstable Material shall consist of materials too wet to properly support the utility pipe, conduit, or appurtenant structure.

D. Degree of Compaction: Degree of compaction required is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557 abbreviated as a percent of laboratory maximum density.

## PART 2 PRODUCTS

### 2.01 IMPORT FILL

A. All import soil and material shall meet the requirements of Section 02300 EARTHWORK, paragraph REQUIREMENTS FOR IMPORT SOIL.

### 2.02 PLASTIC MARKING TAPE AND TRACER WIRE

A. Plastic Marking Tape

1. Plastic marking tape shall be acid and alkali-resistant polyethylene film, 6 inches wide with minimum thickness of 0.004 inch. Tape shall have a minimum strength of 1,750 psi lengthwise and 1,500 psi crosswise. The tape shall be manufactured with integral wires, foil backing or other means to enable detection by a metal detector when the tape is buried up to 3 feet deep. The tape shall be of a type specifically manufactured for marking and locating underground utilities. The metallic core of the tape shall be encased in a protective jacket or provided with other means to protect it from corrosion. Tape color shall be as specified in Table 02316-1 and shall bear a continuous printed inscription describing the specific utility.

| TABLE 02316-1 | |
|---|---|
| Tape Color | Application |
| Red | Electric |
| Yellow | Gas, Oil, Dangerous Materials |
| Orange | Telephone, Telegraph, Television, Police, and Fire Communications |
| Blue | Water Systems |
| Green | Sewer Systems and Storm Drain |

B. Tracer Wire

1. Tracer wire shall be solid 12 gauge insulated copper wire.

## PART 3 EXECUTION

### 3.01 EXCAVATION

A. Excavation shall be performed to the lines and grades indicated. Unauthorized over excavation will be at the Contractor's expense. Excavated soil will be handled in accordance with Section 02111: Excavation and Handling of Contaminated Material.

B. Trench Excavation Requirements: The trench shall be excavated as recommended by the manufacturer of the pipe to be installed. Trench walls below the top of the pipe shall be sloped, or made vertical, and of such width as recommended in the manufacturer's installation manual. Where no manufacturer's installation manual is available, for trenches less than or equal to 4 feet deep, trench walls shall be made vertical. Trench walls more than 4 feet high shall be shored, cut back to a stable slope, or provided with equivalent means of protection for employees who may be exposed to moving ground or cave in. Trench walls which are cut back shall be excavated to at least the angle of repose of the soil. Special attention shall be given to slopes which may be adversely affected by weather or moisture content. The trench width will be in accordance with the contract drawings. Where recommended trench widths are exceeded, redesign, stronger pipe, or

special installation procedures shall be utilized by the Contractor. The cost of redesign, stronger pipe, or special installation procedures shall be borne by the Contractor without any additional cost to the Owner.

1. Bottom Preparation: The bottoms of trenches shall be accurately graded to provide uniform bearing and support for the bottom quadrant of each section of the pipe. Bell holes shall be excavated to the necessary size at each joint or coupling to eliminate point bearing. Stones of 3 inches or greater in any dimension, or as recommended by the pipe manufacturer, whichever is smaller, shall be removed to avoid point bearing.

2. Removal of Unstable Material: Where unstable material is encountered in the bottom of the trench, such material shall be removed to the depth directed and replaced to the proper grade with Import Fill material as provided in paragraph BACKFILLING AND COMPACTION. When removal of unstable material is required due to the Contractor's fault or neglect in performing the work, the resulting material shall be excavated and replaced by the Contractor without additional cost to the Owner.

3. Excavation for Appurtenances: Excavation for manholes, catch-basins, inlets, valve boxes or similar structures shall be sufficient to leave at least 12 inches clear between the outer structure surfaces and the face of the excavation or support members. Rock shall be cleaned of loose debris and cut to a firm surface either level, stepped, or serrated, as shown or as directed. Loose disintegrated rock and thin strata shall be removed. Removal of unstable material shall be as specified above. When concrete or masonry is to be placed in an excavated area, special care shall be taken not to disturb the bottom of the excavation. Excavation to the final grade level shall not be made until just before the concrete or masonry is to be placed.

4. Jacking, Boring, and Tunneling: Unless otherwise indicated, excavation shall be by open cut except that sections of a trench may be jacked, bored, or tunneled if, in the opinion of the Owner, the pipe, cable, or duct can be safely and properly installed and backfill can be properly compacted in such sections.

5. Open Trench: The Contractor shall be responsible for keeping open trenches stable. If Contractor deems a trench to be unstable, the Contractor shall take appropriate measures to ensure trench stability, which may include completely backfilling the trench or suitably covering the trench at the surface. If these trenches are located within the footprint of contaminated soils if backfilling is conducted prior to completion of confirmation sampling in accordance with the Work Plan requirements,

the Contractor will be responsible for removal and off-site disposal of backfill material at his own expense.

C. Stockpiles

1. Stockpiles shall be managed in accordance with 3.04: Soil Stockpiling of Section 02111: Excavation and Handling of Contaminated Material.

## 3.02 BACKFILLING AND COMPACTION

A. Backfill material shall consist of satisfactory material, select granular material, or initial backfill material as required. Backfill shall be placed in layers not exceeding 8 inches loose thickness. Each layer shall be compacted to at least 95 percent maximum density for cohesionless soils and 90 percent maximum density for cohesive soils, unless otherwise specified.

B. Trench Backfill

1. Trenches shall be backfilled to the grade shown.

a. Replacement of Unstable Material: Unstable material removed from the bottom of the trench or excavation shall be replaced with import fill material placed in layers not exceeding 6 inches loose thickness.

C. Backfill for Appurtenances

1. After the valve, fitting, thrust block, valve box or similar appurtenance has been installed backfill shall be placed in such a manner that the appurtenance will not be damaged by the shock of falling earth. The backfill material shall be deposited and compacted as specified for final backfill, and shall be brought up evenly on all sides of the structure to prevent eccentric loading and excessive stress.

## 3.03 SPECIAL REQUIREMENTS

A. Special requirements for both excavation and backfill relating to the specific utilities are as follows:

B. Utilities

1. Trenches shall be of a depth to provide a minimum cover as indicated on the drawings from the existing ground surface, or from the indicated finished grade, whichever is lower, to the top of the pipe.

C. Plastic Marking Tape and Tracer Wire

1. Underground marking tape and location wire shall be installed according to the manufacturer's instructions and as shown on the Drawings. Marking tape and location wire shall extend into all valve boxes. Marking tape and location wire shall be continuous between valves and appurtenances. Free ends resulting from breaks in the tape or at the beginning of a new roll shall be joined together to form a continuous connection. Location wire shall be adequately spliced together at free ends to ensure a positive watertight electrical connection.

D. Control of Water

1. When water is encountered in the excavation, the contractor shall furnish, install, maintain and operate all machinery, appliances, and equipment necessary to maintain conditions suitable for placing bedding material, laying and joining pipe, placing of concrete, and placing backfill material in accordance with the Dewatering Plan described in Section 02111 EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL and until such work has been inspected, and approved by the Owner. Water pumped from the trench shall be disposed of in such a manner as to not cause damage to public or private property, or constitute a nuisance or menace to the public, shall be subject to the prior approval of the Owner and in accordance with Section 01355 ENVIRONMENTAL PROTECTION. Similar to the water extracted from excavations, this water should be discharged to a sanitary sewer.

## 3.04 TESTING

A. Testing of import soil (natural sand specified in Section 02300) used for backfill shall be performed according to Section 02300 EARTHWORK. Import soil used for backfill shall be tested for contaminates in accordance with Paragraph Import Soil and Material.

## PART 4 MEASUREMENT AND PAYMENT

Not used.

**END OF SECTION**

# SECTION 02370

# EROSION AND SEDIMENT CONTROL

## PART 1 GENERAL

### 1.01 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced.

**ASTM International**

| | |
|---|---|
| ASTM D5199 | Standard Test for Measuring Thickness of Geosynthetics/Geotextiles |
| ASTM D6475 | Test Method for Measuring Mass Per Unit Area of Erosion Control Blankets |
| ASTM D1117 | Standard Guide for Evaluating Non Woven Fabrics |
| ASTM D1338 | Standard Guide for Measuring Stiffness of Fabrics |
| ASTM D5035 | Standard Guide for Measuring Breaking Strength and Elongation of Fabrics |

### 1.02 GENERAL REQUIREMENTS

A. Contractor shall implement the erosion control measures in accordance with the Corrective Action Implementation Work Plan (see Appendix A of the Corrective Action Implementation Work Plan) to prevent sediment load in runoff from the Sites.

### 1.03 SUBMITTALS

A. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

1. Product Data for Erosion Control Blanket (S75BN or S150BN or equivalent).

## 1.04 STABILIZATION MEASURES

A. The stabilization practices to be implemented shall include measures described in Section 01502. Erosion control fabric will be placed on the slopes of the restored Building 231 RU area. Currently, only loose straw mulch is proposed for the other restored unpaved areas. The Contractor shall be responsible to determine the need for erosion control fabric placement in these areas. Under no condition shall the Contractor place loose straw mulch on the slopes of the 231 RU area.

On his daily field report, the Contractor shall record the dates when the major excavation activities occur and when construction activities temporarily or permanently cease on a portion of the site; and when stabilization practices are initiated.

# PART 2 PRODUCTS

## 2.01 SINGLE NET EROSION CONTROL BLANKET (North American Green or equivalent, Model No. S75BN)

A. Erosion control blanket shall be short-term single net erosion control blanket, which is constructed of 100 percent biodegradable materials containing a 100 percent agricultural straw fiber matrix. The blanket shall be covered on top with a 100 percent biodegradable woven natural organic fiber netting with an approximate mesh of 0.15 inch x 1 inch.

## 2.02 DOUBLE NET EROSION CONTROL BLANKET (North American Green or equivalent, Model No. S150BN)

A. Erosion control blanket shall be short-term double net erosion control blanket, which is constructed of 100 percent biodegradable materials containing a 100 percent agricultural straw fiber matrix. The blanket shall be covered on top with a 100 percent biodegradable woven natural organic fiber netting with an approximate mesh of 0.15 inch x 1 inch.

## 2.03 STAPLES FOR EROSION CONTROL BLANKET

A. Staples will be recommended by the manufacturer.

## PART 3 EXECUTION

### 3.01 EROSION CONTROL BLANKET INSTALLATION

A. The Contractor shall install erosion control blankets in accordance with manufacturer's recommendations after excavation has been completed. The Contractor shall include costs for placement of the erosion control fabric on the embankments of the Propagule Planting Area (i.e., the 231 RU area).

B. The Contractor shall place erosion control blankets on the slope by abutting adjacent strips to allow for installation of common row of staples. Overlap horizontal joints between erosion control blankets sufficiently to accommodate a common row of staples.

### 3.02 MAINTENANCE INSTRUCTIONS

A. Because the erosion control fabric will be placed following completion of construction, the fabric will have to be maintained by the Owner following demobilization by the Contractor. The Contractor shall furnish written maintenance instructions from the manufacturer, describing the care of the installed material; including, when and where maintenance should occur, and the procedures for material placement.

## PART 4 MEASUREMENT AND PAYMENT

Not used.

**END OF SECTION**

# SECTION 02481

# SEEDING

## PART 1 GENERAL

### 1.01 REFERENCES

A. STATE OF CALIFORNIA FOOD AND AGRICULTURE CODE (SECTION 52288), "California Seed Law"

### 1.02 GENERAL REQUIREMENTS

A. The Work generally consists of seeding with Dwarf Tall Fescue Grass (species name: Festuca arundinacea) to restore the landscaped areas of former building 207 RU and former building 38 RU areas. No seeding will be applied for construction and post construction phase erosion control purposes.

### 1.03 SUBMITTALS

A. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

1. Seed Label: Prior to placement of seed, Contractor shall furnish the engineer with a copy of the seed label indicating seed variety, percent live seed, percent germination, percent of inert material, percent weed content, test date, and viability assurance statement.

2. Post Construction Phase Maintenance Plan: Contractor shall provide a post-construction phase maintenance plan to be followed by the Trust

### 1.04 QUALITY ASSURANCE

A. Seed shall be approved for use provided it meets the following criteria:

1. Percent live seed: Greater than or equal to 95%
2. Germination rate: Greater than or equal to 95%
3. Inert material: Less than 5%
4. Percent weed seeds: No weeds allowed
5. No noxious weed seed is permitted
6. Seed shall have been tested within the 8 month period prior to its application (planting)
7. Seed shall be current as of the time of application (planting), as indicated by the viability statement contained on the seed label

## PART 2 PRODUCTS

### 2.01 DWARF TALL FESCUE

A. Dwarf tall fescue seed (species name: Festuca arundinacea) shall be used for replacement of turf within the former building 207 RU and 38 RU areas.

## PART 3 EXECUTION

### 3.01 SEED INSTALLATION SPECIFICATIONS

A. Prior to Installing Seed: Contractor shall assure that site grades match existing grades in surrounding areas. Areas to be seeded shall be scarified to a depth of not less than 2 inches prior to seeding. Seeding operations shall not take place when the wind velocity will prevent uniform seed distribution.

B. Installing Seed: Seeding method shall be either dry seeding or hydroseeding. When dry seeding is used, the Contractor shall use a weighted landscape roller over the area to provide for good seed to soil contact. When hydroseeding is used, the Contractor will ensure that the "seed" tanks are flushed prior to use at the Site.

### 3.02 SEED MONITORING

A. Construction Phase Monitoring: The Contractor shall be responsible for execution, monitoring, repair, and for maintenance during the construction phase.

1. Maintenance During Construction Phase: Maintenance of the seeded areas shall include: maintaining erosion control materials and mulch; protecting installed areas from traffic; and watering.

2. Repair or Reinstall: Unsatisfactory stand of grass plants and mulch shall be repaired or reinstalled, and eroded areas shall be repaired.

3. Maintenance Record: A record of each site visit shall be furnished, describing the maintenance work performed; and areas repaired or reinstalled.

B. Monitoring Following Construction Phase: The Trust will be responsible for monitoring following Contractor demobilization. The Trust will conduct the monitoring in accordance with written instructions and protocol provided by the Contractor.

## PART 4 MEASUREMENT AND PAYMENT

### 4.01 MEAUSUREMENT

A. Seeding of Former Building 207 RU – The unit of measurement for seed application will be on a per square foot basis.

B. Seeding of Former Building 38 RU – The unit of measurement for seed application will be on a per square foot basis.

### 4.02 PAYMENT

A. Seeding of Former Building 207 RU – Payment will include site preparation, seed application, and construction phase monitoring, and preparation of written maintenance instructions and protocol to be provided to the Trust during the "post-construction" phase.

B. Seeding of Former Building 38 RU – Payment will include site preparation, seed application, and construction phase monitoring, and preparation of written maintenance instructions and protocol to be provided to the Trust during the "post-construction" phase.

**END OF SECTION**

# SECTION 02510

# WATER DISTRIBUTION SYSTEM

## PART 1 GENERAL

### 1.01 REFERENCES

A. ANSI/AWWA C150/A21.50 American National Standard for Thickness Design of Ductile Iron Pipe

B. AWWA C111 (1995) Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

C. AWWA C115 (1996) Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges

D. AWWA C151 (1996) Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids

E. ASTM D3350 (2001) Standard Specification for Polyethylene Pipes and Fittings

F. NSF 61(1999) Drinking Water System Components - Health Effects (Sections 1-9)

### 1.02 GENERAL REQUIREMENTS

A. The Work generally consists of construction of water (potable and firewater) distribution mains and service connections. The sequencing of the work will be in accordance with 1.06 WORK SEQUENCING and the Contract Drawings.

### 1.03 PIPING

A. This section covers the installation of water (potable and fire water) distribution and service lines and connections. The Contractor shall have a copy of the manufacturer's recommendations for each material or procedure to be utilized available at the construction site at all times.

1. Service Lines: Piping for underground water service lines 3 inches and larger shall be high density polyethylene (HDPE) pipe unless otherwise shown or specified.

2. Distribution Lines: Piping for underground water distribution lines 3 inches or larger shall be high density polyethylene (HDPE) pipe unless otherwise shown or specified.

3. Potable Water Lines: Piping and components of potable water systems which come in contact with the potable water shall conform to NSF 61.

4. Above Ground Distribution Lines: Aboveground piping and components for potable and fire water distribution lines shall be ductile iron pipes unless otherwise shown or specified.

5. Excavation, Trenching, and Backfilling: Excavation, trenching, and backfilling shall be in accordance with the applicable provisions of Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS.

## 1.04 SUBMITTALS

The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

A. Product Data

1. Installation and Operation Instructions: The manufacturer's installation and operation instructions and recommendations for each material or procedure to be utilized.

2. Satisfactory Installation: A statement signed by the principal officer of the contracting firm stating that the installation is satisfactory and in accordance with the contract drawings and specifications, and the manufacturer's prescribed procedures and techniques, upon completion of the project and before final acceptance.

B. Test Reports

1. Bacteriological Disinfection: Test results from commercial laboratory verifying disinfection.

2. Hydrostatic Pressure Testing: Test results by the principal officer of the Contractor firm stating that the pressure testing meets the intent of these specifications.

3. Satisfactory Installation: A statement signed by the principal officer of the Contractor firm stating that the installation is satisfactory and in accordance with the contract drawings and specifications, and the manufacturer's prescribed procedures and techniques, upon completion of the project and before final acceptance. Device test results will be attached to the statement.

C. Building 230 Sprinkler System Plan

1. A plan and calculations certified by a Fire Protection Systems Engineer for installation of fire protection junction device (see Sheet C-111), new connection for sprinkler system for Building 230, and calculations supporting the sprinkler design for Building 230 (see sheets C-111 and C-112 for new connections for the sprinkler system).

## 1.05 WORK SEQUENCING

A. Building 230 RU Area – Prior to excavation in the Building 230 RU Area, provide alternate connection as shown on C-111.

B. Building 231 RU Area – Following completion of excavation and during backfilling of the 231 RU excavation, restore replacement water service to Building 231 as shown on C-112.

## 1.06 HANDLING

A. Pipe and accessories shall be handled to ensure delivery to the trench in sound, undamaged condition, including no injury to the pipe. If the lining of any pipe or fitting is damaged, the repair shall be made by the Contractor in a satisfactory manner, at no additional cost to the Owner. Pipe shall be carried into position and not dragged. The interior of pipe and accessories shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations by plugging or other approved method. Before installation, the pipe shall be inspected for defects. Material found to be defective before or after laying shall be replaced with sound material without additional expense to the Trust. Rubber gaskets that are not to be installed immediately shall be stored in a cool and dark place.

## PART 2 PRODUCTS

### 2.01 HDPE PIPE

A. HDPE plastic pipe, tubing, and heat-fusion fittings shall conform to AWWA C901.

B. HDPE Piping shall be PE3408, CSR Polypipe or Equivalent.

### 2.02 DUCTILE IRON PIPE

A. Ductile Iron Piping shall conform to ANSI/AWWA C150/A21.50

### 2.03 JOINTS

A. HDPE Piping: Welded Joints by heat fusion per the Manufacturer's recommended procedures.

B. Ductile-Iron Pipe Jointing

1. Mechanical joints shall be of the stuffing box type and shall conform to AWWA C111.

2. Push-on joints shall conform to AWWA C111.

3. Rubber gaskets and lubricants shall conform to the applicable requirements of AWWA C111.

### 2.04 VALVES

A. Gate valves shall be designed for a working pressure of not less than 200 psi. Valve connections shall be as required for the piping in which they are installed. Valves shall have a clear waterway equal to the full nominal diameter of the valve, and shall be opened by turning counterclockwise. The operating nut or wheel shall have an arrow, cast in the metal, indicating the direction of opening. Gate valves shall be non-rising stem and equipped with a two (2) inch square operating nut. Resilient-seated gate valves shall conform to AWWA C509.

## 2.05 ACCESSORIES AND APPURTENANCES

A. Valve keys shall be 1/2 inch diameter by 3 feet long, tee handles and keyed to fit valves.

B. Valve boxes shall be cast iron, or precast concrete for each gate valve. Box sizes shall be adjustable for valve used. Shaft diameter of box shall be a minimum 5-1/4 inches. Cast iron box shall have bituminous coating.

## 2.06 VALVE BOXES

A. Valve boxes shall be cast iron or concrete. Cast-iron boxes shall be extension type with slide-type adjustment and with flared base. The minimum thickness of metal shall be 3/16 inch. Concrete boxes shall be the standard product of a manufacturer of precast concrete equipment. The word "WATER" shall be cast in the cover. The box length shall adapt, without full extension, to the depth of cover required over the pipe at the valve location.

## 2.07 JUNCTION DEVICE FOR SPRINKLER SYSTEM

A. Junction Device to be placed on east side of Building 230. Device will include backflow preventor (with a dual on/off valve) and a fire department connection valve. Contractor to submit the spec for the device to be used with the Building 230 Sprinkler System Plan for approval by the GGNRA Presidio Fire Department.

## 2.08 MISCELLANEOUS ITEMS

A. Disinfection: Chlorinating materials shall conform to the following:

1. Chlorine, Liquid: AWWA B301.

2. Hypochlorite, Calcium, and Sodium: AWWA B300.

# PART 3 EXECUTION

## 3.01 INSTALLATION

A. Cutting of pipe shall be done in a neat and workman-like manner without damage to the pipe.

B. Sewer Lines: Where the location of the water pipe is not clearly defined in dimensions on the drawings, the joints in the water pipe shall not be laid closer

horizontally than 9 feet from a sewer. A minimum vertical separation of 1 feet will be maintained between sewer lines and water lines at vertical crossings where the water pipe is placed above the sewer pipe.

C. Water lines shall not be laid in the same trench with sewer lines, gas lines, fuel lines, or electric wiring.

D. Maximum offset in alignment between adjacent pipe joints shall be as recommended by the manufacturer and approved by the Owner or Engineer, but shall not exceed 5 degrees.

E. Placing and laying: Pipe and accessories shall be carefully lowered into the trench by means of derrick, ropes, belt slings, or other authorized equipment. Water-line materials shall not be dropped or dumped into the trench. Abrasion of the pipe shall be avoided. Except where necessary in making connections with other lines or as authorized by the Owner or Engineer, pipe shall be laid with the bells facing in the direction of laying. The full length of each section of pipe shall rest solidly upon the pipe bed, with recesses excavated to accommodate bells, couplings, and joints. Pipe that has the grade or joint disturbed after laying shall be taken up and re-laid. Pipe shall not be laid in water or when trench conditions are unsuitable for the work. Water shall be kept out of the trench until joints are complete. When work is not in progress, open ends of pipe, fittings, and valves shall be securely closed so that no trench water, earth, or other substance will enter the pipes or fittings. Where any part of the pipe is damaged, the repair shall be made by and at the Contractor's expense in a satisfactory manner. Pipe ends left for future connections shall be valved, plugged, or capped, and anchored, as shown.

F. Piping Connections: Where connections are made between new work and existing mains, the connections shall be made by using specials and fittings to suit the actual conditions. When made under pressure, these connections shall be installed using standard methods as approved by the Owner or Engineer.

G. Transition Fittings: Connections between different types of pipe and accessories shall be made with transition fittings (e.g., between HDPE and ductile and ACP and HDPE) approved by the Owner or Engineer.

H. Service lines shall include the pipeline connecting building piping to water distribution lines to the connections with the building service at a point approximately 5 feet outside the building where such building service exists.

I. Thrust Restraint: Plugs, caps, tees and bends deflecting 11.25 degrees or more, either vertically or horizontally, on waterlines 4 inches in diameter or larger shall be provided with thrust restraints. Valves shall be securely anchored or shall be provided with thrust restraints to prevent movement. Thrust restraints shall be either thrust blocks or, for ductile-iron pipes, restrained joints.

## 3.02 HYDROSTATIC TESTS

A. Where any section of a water line is provided with concrete thrust blocking for fittings or hydrants, the hydrostatic tests shall not be made until at least 5 days after installation of the concrete thrust blocking, unless otherwise approved.

B. Pressure Test: After the pipe is laid, the joints completed, and the trench partially backfilled leaving the joints exposed for examination, the newly laid piping or any valved section of piping shall, unless otherwise specified, be subjected for 24 hours to the regular hydrostatic pressure of the water distribution system. The test pressure shall be 200 psi. Each valve shall be opened and closed several times during the test. Exposed pipe, joints, fittings, and valves shall be carefully examined during the partially open trench test. Joints showing visible leakage shall be replaced or remade as necessary. Cracked or defective pipe, joints, fittings, hydrants, and valves discovered in consequence of this pressure test shall be removed and replaced with sound material, and the test shall be repeated until the test results are satisfactory. The requirement for the joints to remain exposed for the hydrostatic tests may be waived by the Owner or Engineer when one or more of the following conditions are encountered:

1. Wet or unstable soil conditions in the trench.

2. Compliance would require maintaining barricades and walkways around and across an open trench in a heavily used area that would require continuous surveillance to assure safe conditions.

3. Maintaining the trench in an open condition would delay completion of the project.

C. The Contractor may request a waiver, setting forth in writing the reasons for the request and stating the alternative procedure proposed to comply with the required hydrostatic tests. Backfill placed prior to the tests shall be placed in accordance with the requirements of Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS.

D. Leakage test shall be conducted after the pressure tests have been satisfactorily completed. The duration of each leakage test shall be at least 2 hours, and during the test the water line shall be subjected the regular hydrostatic pressure of the water distribution system. Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved or approved section, necessary to maintain pressure within 5 psi of the specified leakage test pressure after the pipe has been filled with water and the air expelled. Piping installation will not be accepted if leakage exceeds the allowable leakage; the allowable leakage will be obtained from the pipe manufacturer and provided to the Engineer for approval prior to the initiation of the pressure test.

Should any test of pipe disclose leakage greater than that calculated by the above formula, the defective joints shall be located and repaired until the leakage is within the specified allowance, without additional cost to the Owner.

E. The Contractor may elect to conduct the hydrostatic tests using either or both of the following procedures. Regardless of the sequence of tests employed, the results of pressure tests, leakage tests, and disinfection shall be as specified. Replacement, repair or retesting required shall be accomplished by the Contractor at no additional cost to the Owner.

1. Pressure test and leakage test may be conducted concurrently.

2. Hydrostatic tests and disinfection may be conducted concurrently, using the water treated for disinfection to accomplish the hydrostatic tests. If water is lost when treated for disinfection and air is admitted to the unit being tested, or if any repair procedure results in contamination of the unit, disinfection shall be re-accomplished.

## 3.03 BACTERIAL DISINFECTION

A. Before acceptance of potable water operation, each unit of completed waterline shall be disinfected as specified. After pressure tests have been made, the unit to be disinfected shall be thoroughly flushed with water until all entrained dirt and mud have been removed before introducing the chlorinating material. The chlorinating material shall be liquid chlorine, calcium hypochlorite, or sodium hypochlorite, conforming to paragraph MISCELLANEOUS ITEMS. The chlorinating material shall provide a dosage of not less than 50 ppm and shall be introduced into the water lines in an approved manner. The treated water shall be retained in the pipe long enough to destroy all non-spore forming bacteria. Except where a shorter period is approved, the retention time shall be at least 24 hours and shall produce not less than 25 ppm of free chlorine residual throughout the line at the end of the retention period. Valves on the lines being disinfected shall be opened and closed several times during the contact period. The line shall then be flushed with clean water until the residual chlorine is reduced to less than 1.0 ppm. During the flushing period, each fire hydrant on the line shall be opened and closed several times. From several points in the unit, personnel from the Contractor's commercial laboratory shall take at least 3 water samples from different points, approved by the Owner or Engineer, in proper sterilized containers and perform a bacterial examination in accordance with state approved methods. The commercial laboratory shall be certified by the state's approving authority for examination of potable water. The disinfection shall be repeated until tests indicate the absence of pollution for at least 2 full days. The unit will not be accepted until satisfactory bacteriological results have been obtained.

B. Wastewater derived from flushing of disinfection water shall be discharged in accordance with Section 01355 ENVIRONMENTAL PROTECTION.

## 3.04 BUILDING 230 SPRINKLER SYSTEM CONNECTION

A. Contractor shall hire a fire protection system Engineer to prepare a sprinkler system connection plan for Building 230 for approval by the GGNRA Presidio Fire Department.

B. Contractor shall obtain required permits from the GGNRA Presidio Fire Department prior to making the Building 230 sprinkler system connection.

C. Contractor shall execute the work and the required testing in accordance with the permit requirements.

## 3.05 CLEANUP

A. Upon completion of the installation of water lines, and appurtenances, all debris and surplus materials resulting from the work shall be removed.

# PART 4 MEASUREMENT AND PAYMENT

## 4.1 MEASUREMENT

A. Installation of New Underground Water Piping unit of measure will be per lineal feet of new underground water pipe installed.

B. Fire Sprinkler Design unit of measure will be lump sum.

C. Fire Sprinkler System Connection for Building 230 will be a lump sum.

## 4.2 PAYMENT

A. Installation of New Underground Water Piping – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to install new underground water piping and appurtenances in accordance with these specifications. The Contractor will be responsible for delivering a fully functional system for use during construction.

B. Fire Sprinkler Design – Payment will be for design of the fire sprinkler system connection for Building 230 by a fire protection engineer and permitting associated with the design by the Presidio Fire Department.

C. Fire Sprinkler System Connection for Building 230 – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to transition from new underground water piping to above ground piping, installation of the fire system junction device, installation of new piping underneath the building to route the piping from the east to the west side of the building for connection to the existing fire sprinkler riser, located on the east side of Building 230 in accordance with these specifications. The Contractor will be responsible for delivering a fully functional system for use during construction.

**END OF SECTION**

# SECTION 02531

# SANITARY SEWER SYSTEM

## PART 1 GENERAL

### 1.01 REFERENCES

A. ASTM D 3350-01 (2001). Standard Specifications for Polyethylene Pipe and Fitting Materials

### 1.02 SUBMITTALS

The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

A. Product Data

1. Placing Pipe: Printed copies of the manufacturer's recommendations for installation procedures of the material being placed, prior to installation.

2. Shop drawings for precast concrete manholes, ejector pump, and polyethylene piping (extra molecular weight [EHMW] high density polyethylene, CSR Polypipe or equivalent).

### 1.03 DELIVERY, STORAGE, AND HANDLING

A. Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. Materials shall not be stored directly on the ground. The inside of pipes and fittings shall be kept free of dirt and debris. Before, during, and after installation, pipe and fittings shall be protected from any environment that would result in damage or deterioration to the material. The Contractor shall have a copy of the manufacturer's instructions available at the construction site at all times and shall follow these instructions unless directed otherwise by the Owner or Engineer.

B. Materials shall be handled in a manner that ensures delivery to the trench in sound, undamaged condition. Pipe shall be carried to the trench, not dragged.

## 1.04 WORK SEQUENCE

A. Provide temporary service in accordance with C-116: Sanitary Sewer Decommissioning and Rerouting Plan.

B. Replace sewer piping within the 231 RU Area in accordance with C-117: Sanitary Sewer Realignment Plan and Profile.

C. Remove the provided temporary plugs and the temporary service piping to restore sewer service in the project area.

# PART 2 PRODUCTS

## 2.01 PE PIPE FOR SEWERS

A. Pipe shall be EHMW HDPE, PE 3408, CSR Polypipe or equivalent.

## 2.02 EJECTOR PUMP

A. Sewage Pumps, 4/10 horsepower, capable of pumping 20 gallons per minute at 15 feet of head (Hydromatic or Equivalent, see attached cut sheet).

## 2.03 PRECAST CONCRETE MANHOLES

A. Jensen Precast Concrete Products or equivalent, Compressive Strength of 4,000 psi.

# PART 3 EXECUTION

## 3.01 INSTALLATION

**Temporary Piping Installation**

A. Cutting of pipe shall be done in a neat and workman-like manner without damage to the pipe.

B. Sewer Lines: Where the location of the water pipe is not clearly defined in dimensions on the drawings, the sewer pipe will have a minimum horizontal clearance of 9 feet from the joints in the water pipe. A minimum vertical separation of 1 feet will be maintained where the sewer pipe is below the water lines at crossings.

C. Placing and laying: Pipe and accessories shall be laid as shown on Sheet C-117 of the contract drawings. Sections where pipe is to be aboveground and sections where pipe is to be placed below ground are shown on the contract drawings. Where any part of the pipe is damaged, the repair shall be made by and at the Contractor's expense in a satisfactory manner.

**New Permanent Piping Installation**

A. Cutting of pipe shall be done in a neat and workman-like manner without damage to the pipe.

B. Sewer Lines: Where the location of the water pipe is not clearly defined in dimensions on the drawings, the sewer pipe will have a minimum horizontal clearance of 9 feet from the joints in the water pipe. A minimum vertical separation of 1 feet will be maintained where the sewer pipe is below the water lines at crossings.

C. Sewer piping shall not be laid in the same trench as water pipes.

D. Maximum offset in alignment between adjacent pipe joints shall be as recommended by the manufacturer and approved by the Owner or Engineer, but shall not exceed 5 degrees.

E. Placing and laying: Pipe and accessories shall be carefully lowered into the trench by means of derrick, ropes, belt slings, or other authorized equipment. Water-line materials shall not be dropped or dumped into the trench. Abrasion of the pipe shall be avoided. Except where necessary in making connections with other lines or as authorized by the Owner or Engineer, pipe shall be laid with the bells facing in the direction of laying. The full length of each section of pipe shall rest solidly upon the pipe bed, with recesses excavated to accommodate bells, couplings, and joints. Pipe that has the grade or joint disturbed after laying shall be taken up and re-laid. Pipe shall not be laid in water or when trench conditions are unsuitable for the work. Water shall be kept out of the trench until joints are complete. When work is not in progress, open ends of pipe, fittings, and valves shall be securely closed so that no trench water, earth, or other substance will enter the pipes or fittings. Where any part of the pipe is damaged, the repair shall be made by and at the Contractor's expense in a satisfactory manner.

F. Piping Connections: Where connections are made between new work and existing sewer lines, the connections shall be made by using specials and fittings to suit the actual conditions.

G. Transition Fittings: Connections between different types of pipe and accessories shall be made with transition fittings (e.g., between HDPE and vitrified clay) approved by the Owner or Engineer.

## 3.02 JOINTING

A. HDPE Piping: Welded Joints by heat fusion per the Manufacturer's recommended procedures.

## 3.03 MANHOLES

A. Contractor to provide shop drawing for precast concrete manhole (minimum compressive strength 4000 psi); Contractor shall lower into the identified location and make connections with the sewer piping in accordance with detail shown on Sheet C-503 and in accordance with manufacturer's recommendations.

## 3.04 TESTING OF SEWERS

This specification applies only to the final placement of the sewer line within the 231 RU area.

A. Subject pipe to hydrostatic pressure produced by a head of water at depth of 3 feet above invert of sewer at upper manhole under test. In areas where groundwater exists, head of water shall be 2 feet above existing water table. Maintain head of water for one hour for full absorption by pipe body before testing. During one hour test period, measured maximum allowable rate of exfiltration for any section shall be 3 gallons per hour per 300 feet.

B. If groundwater levels are at levels such that exfiltration tests are deemed impracticable, the shall use infiltration tests in lieu of exfiltration tests. Allowable leakage for this test will be the same as that for the infiltration tests.

# PART 4 MEASUREMENT AND PAYMENT

## 4.01 MEASUREMENT

A. Installation of Temporary Sanitary Sewer Connection unit of measure will be per lineal feet of sewer pipe installed.

B. Installation of Sanitary Sewer Piping Following 230 RU Backfilling unit of measure will be per lineal feet of sewer pipe installed

C. Installation of New Sanitary Sewer Manholes will be for each manhole installed.

## 4.2 PAYMENT

A. Installation of Temporary Sanitary Sewer Connection – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to install the temporary sewer connection and appurtenances in accordance with these specifications. The Contractor will be responsible for delivering a fully functional system for use during construction. Payment will also include removal of the temporary system following completion of construction and at the direction of the Owner/Engineer.

B. Installation of Sanitary Sewer Piping Following 230 RU Backfilling – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to install sanitary sewer piping following 230 RU backfilling and appurtenances in accordance with these specifications. The Contractor will be responsible for delivering a fully functional system for use during construction.

C. Installation of New Sanitary Sewer Manholes – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to install the new sanitary sewer manholes in accordance with these specifications.

**END OF SECTION**

# SECTION 02630

# STORM DRAINAGE SYSTEM

## PART 1 GENERAL

### 1.01 REFERENCES

A. ASTM D 3350-01 (2001). Standard Specifications for Polyethylene Pipe and Fitting Materials

### 1.02 SUBMITTALS

The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

A. Product Data

1. Placing Pipe: Printed copies of the manufacturer's recommendations for installation procedures of the material being placed, prior to installation.

2. Shop drawings for drain inlet, pump to be used for transferring storm water from the catch basin on the southeast corner of the Building 231 RU excavation, and tideflex check valve.

### 1.03 DELIVERY, STORAGE, AND HANDLING

A. Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. Materials shall not be stored directly on the ground. The inside of pipes and fittings shall be kept free of dirt and debris. Before, during, and after installation, pipe and fittings shall be protected from any environment that would result in damage or deterioration to the material. The Contractor shall have a copy of the manufacturer's instructions available at the construction site at all times and shall follow these instructions unless directed otherwise by the Owner or Engineer.

B. Materials shall be handled in a manner that ensures delivery to the trench in sound, undamaged condition. Pipe shall be carried to the trench, not dragged.

## 1.04 WORK SEQUENCE

A. Provide temporary service in accordance with C-114: Storm Drain Utility Plan, South Area.

B. Construct new storm drainage system in the Propagule Planting Area to transfer storm water from this area into the existing 72-inch storm drain line (see C-121, Restoration Plan).

# PART 2 PRODUCTS

## 2.01 PE PIPE FOR STORM DRAIN

A. Pipe shall be HDPE, PE 3408, CSR Polypipe or equivalent.

## 2.02 STORM DRAIN TRANSFER PUMP

A. Transfer Pumps, capable of transferring approximately 50 gpm and approximately 10 feet of total head.

## 2.03 PRECAST DRAIN INLET

A. Jensen Precast Concrete Products or equivalent, Compressive Strength of 4,000 psi.

## 2.04 TIDE FLEX VALVE

A. 37 G In Line Check Valve Manufacturer: Red Valve Company or Equivalent, Carnegie, PA. http://www.tideflex.com/tf/index.php

# PART 3 EXECUTION

## 3.01 INSTALLATION

A. Cutting of pipe shall be done in a neat and workman-like manner without damage to the pipe.

B. Maximum offset in alignment between adjacent pipe joints shall be as recommended by the manufacturer and approved by the Owner or Engineer, but shall not exceed 5 degrees.

C. Placing and laying: Pipe and accessories shall be carefully lowered into the trench by means of derrick, ropes, belt slings, or other authorized equipment. Abrasion of the pipe shall be avoided. Except where necessary in making connections with other lines or as authorized by the Owner or Engineer, pipe shall be laid with the bells facing in the direction of laying. The full length of each section of pipe shall rest solidly upon the pipe bed, with recesses excavated to accommodate bells, couplings, and joints. Pipe that has the grade or joint disturbed after laying shall be taken up and re-laid. Pipe shall not be laid in water or when trench conditions are unsuitable for the work. Water shall be kept out of the trench until joints are complete. When work is not in progress, open ends of pipe, fittings, and valves shall be securely closed so that no trench water, earth, or other substance will enter the pipes or fittings. Where any part of the pipe is damaged, the repair shall be made by and at the Contractor's expense in a satisfactory manner.

D. Piping Connections: Where connections are made between new work and existing sewer lines, the connections shall be made by using specials and fittings to suit the actual conditions.

E. Transition Fittings: Connections between different types of pipe and accessories shall be made with transition fittings (e.g., between HDPE and reinforced concrete piping) approved by the Owner or Engineer.

F. Tide Flex Check Valve: Contractor shall install an inline check valve at the outlet end of the drain inlet inside the PE pipe (see Sheet C-502 for connection detail).

## 3.02 JOINTING

A. HDPE Piping: Welded Joints by heat fusion per the Manufacturer’s recommended procedures.

## 3.03 DRAIN INLETS

A. Contractor to provide shop drawing for precast concrete drian inlets (minimum compressive strength 4,000 psi); Contractor shall lower into the identified location and make connections with the storm drain piping in accordance with detail shown on Sheet C-502 and in accordance with manufacturer’s recommendations.

## PART 4 MEASUREMENT AND PAYMENT

### 4.01 MEASUREMENT

A. Installation of Storm Drain Line Behind Building 231 RU unit of measure will be per lineal feet of storm drain line installed.

B. Installation of Storm Drain Line Inside Building 231 RU unit of measure will be per lineal feet of storm drain line installed.

C. Installation of New Drain Inlets will be for each inlet installed.

### 4.2 PAYMENT

A. Installation of Storm Drain Line Behind Building 231 RU – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to install the new storm drain line and appurtenances in accordance with these specifications. The Contractor will be responsible for delivering a fully functional system.

B. Installation of Storm Drain Line Inside Building 231 RU – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to install new storm drain line and appurtenances in accordance with these specifications. The Contractor will be responsible for delivering a fully functional system for use during construction.

C. Installation of New Drain Inlets – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to install the new drain inlets in accordance with these specifications.

**END OF SECTION**

# SECTION 02720

# AGGREGATE BASE COURSE

## PART 1 GENERAL

## 1.01 REFERENCES

A. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) C 117 - (1995) Materials Finer than 75 micrometer (No. 200) Sieve in Mineral Aggregates by Washing

B. ASTM C 131 - (1996) Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

C. ASTM C 136 - (1996a) Sieve Analysis of Fine and Coarse Aggregates

D. ASTM D 75 - (1987; R 1997) Sampling Aggregates

E. ASTM D 422 - (1963; R 1998) Particle-Size Analysis of Soils

F. ASTM D 1556 - (2000) Density and Unit Weight of Soil in Place by the Sand-Cone Method

G. ASTM D 1557 - (1991; R 1998) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/cu. ft. (2,700 kN-m/cu.m.))

H. ASTM D 2487 - (2000) Classification of Soils for Engineering Purposes (Unified Soil Classification System)

I. ASTM D 4318 - (2000) Liquid Limit, Plastic Limit, and Plasticity Index of Soils

J. ASTM E 11 - (1995) Wire-Cloth Sieves for Testing Purposes

K. STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION (CDT) SS-26 - (2002) Caltrans Standard Specifications - Section 26 - Aggregate Bases

## 1.02 DEFINITIONS

A. For the purposes of this specification, the following definitions apply.

1. Aggregate Base Course: Aggregate base course (ABC) is well graded, durable aggregate uniformly moistened and mechanically stabilized by compaction.

2. Degree of Compaction: Degree of compaction is a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557 abbreviated herein as laboratory maximum density.

## 1.03 SUBMITTALS

A. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

1. Plant, Equipment, and Tools: List of proposed equipment to be used in performance of construction work, including descriptive data.

2. Waybills and Delivery Tickets: Copies of waybills and delivery tickets during the progress of the work. Before the final statement is allowed, the Contractor shall file certified waybills and certified delivery tickets for all aggregates actually used.

3. Field Density Tests: Calibration curves and related test results prior to using the device or equipment being calibrated. Copies of field test results within 24 hours after the tests are performed. Certified copies of test results for approval not less than 30 days before material is required for the work.

## 1.04 SAMPLING AND TESTING

A. Sampling and testing shall be the responsibility of the Contractor, except the chemical analytical testing, which will be conducted by the Owner. Sampling and testing shall be performed by a testing laboratory approved by the Owner. Work requiring testing will not be permitted until the testing laboratory has been inspected and approved. The materials shall be tested to establish compliance with the specified requirements; testing shall be performed at the specified frequency. The Owner may specify the time and location of the tests. Copies of test results shall be furnished to the Owner within 24 hours of completion of the tests.

B. Sampling: Samples for laboratory testing shall be taken in conformance with ASTM D 75. When deemed necessary, the sampling will be observed by the Owner.

1. Tests: The following tests shall be performed in conformance with the applicable standards listed.

a. Sieve Analysis: Sieve analysis shall be made in conformance with ASTM C 117 and ASTM C 136. Sieves shall conform to ASTM E

11. Particle-size analysis of the soils shall also be completed in conformance with ASTM D 422.

b. Liquid Limit and Plasticity Index: Liquid limit and plasticity index shall be determined in accordance with ASTM D 4318.

c. Moisture-Density Determinations: The maximum density and optimum moisture content shall be determined in accordance with ASTM D 1557.

d. Field Density Tests: Density shall be field measured in accordance with ASTM D 1556. For the method presented in ASTM D 1556 the base plate as shown in the drawing shall be used.

e. Wear Test: Wear tests shall be made on ABC course material in conformance with ASTM C 131.

2. Testing Frequency

a. Initial Tests: One Sieve Analysis, Liquid limit and plasticity index, Moisture-density relationship and Wear test shall be performed on the proposed material prior to commencing construction to demonstrate that the proposed material meets all specified requirements when furnished. If materials from more than one source are going to be utilized, this testing shall be completed for each source.

b. In Place Tests: Density tests shall be performed on every lift of material placed and at a frequency of one set of tests per lift for every 100LF of completed trench. Where aggregate base course is required in light use pavement areas and on Gorgas Avenue, one set of test per lift for every 50 SY is required.

3. Approval of Material: The source of the material shall be selected 30 days prior to the time the material will be required in the work. In addition, the Owner will collect a sample of each ABC source proposed for use by Contractor and test the sample in accordance with the requirements of Part C, 1.06 REQUIREMENTS OF IMPORT SOIL, Section 02300, Earthwork and Table 02300-1. Final approval of the materials will be based on sieve analysis, liquid limit, and plasticity index tests performed on samples taken from the completed and fully compacted ABC. Final approval of the materials will be based on sieve analysis, liquid limit, plasticity index tests, and chemical analytical tests performed on samples taken from the completed and fully compacted ABC.

## 1.05 PLANT, EQUIPMENT, AND TOOLS

A. All plant, equipment, and tools used in the performance of the work will be subject to approval before the work is started, and shall be maintained in satisfactory working condition at all times. The equipment shall be adequate and shall have the capability of producing the required compaction, meeting grade controls, thickness control, and smoothness requirements as set forth herein.

# PART 2 PRODUCTS

## 2.01 AGGREGATES

A. ABC shall be 3/4" Class II in conformance to CDT SS-26.

# PART 3 EXECUTION

## 3.01 GENERAL REQUIREMENTS

A. When the ABC is constructed in more than one layer, the previously constructed layer shall be cleaned of loose and foreign matter by sweeping with power sweepers or power brooms, except that hand brooms may be used in areas where power cleaning is not practicable. Adequate drainage shall be provided during the entire period of construction to prevent water from collecting or standing on the working area.

## 3.02 STOCKPILING MATERIAL

A. Prior to stockpiling of material, storage sites shall be cleared and leveled by the Contractor. All materials shall be stockpiled in the manner and at the locations designated. Aggregates shall be stockpiled on the cleared and leveled areas designated by the Owner to prevent segregation. Materials obtained from different sources shall be stockpiled separately.

## 3.03 PREPARATION OF UNDERLYING COURSE

A. Prior to constructing the ABC, the underlying course or subgrade shall be cleaned of all foreign substances. At the time of construction of the ABC, the underlying course shall contain no frozen material. The surface of the underlying course or subgrade shall meet specified compaction and surface tolerances. Ruts or soft yielding spots in the underlying courses, areas having inadequate compaction, and deviations of the surface from the requirements set forth herein shall be corrected by loosening and removing soft or unsatisfactory material and by adding approved material, reshaping to line and grade, and re-compacting to specified density requirements. For cohesionless underlying courses containing sands or gravels, as defined in ASTM D 2487, the surface shall be stabilized prior to placement of the

ABC. Stabilization shall be accomplished by mixing ABC into the underlying course and compacting by approved methods. The stabilized material shall be considered as part of the underlying course and shall meet all requirements of the underlying course. The finished underlying course shall not be disturbed by traffic or other operations and shall be maintained by the Contractor in a satisfactory condition until the ABC is placed.

## 3.04 INSTALLATION

A. Mixing the Materials: The coarse and fine aggregates shall be mixed in a stationary plant, or in a traveling plant or bucket loader on an approved paved working area. The Contractor shall make adjustments in mixing procedures or in equipment as directed to obtain true grades, to minimize segregation or degradation, to obtain the required water content, and to insure a satisfactory ABC meeting all requirements of this specification.

B. Placing: The mixed material shall be placed on the prepared subgrade or subbase in layers of uniform thickness with an approved spreader. When a compacted layer 6 inches or less in thickness is required, the material shall be placed in a single layer. No layer shall exceed 6 inches or less than 3 inches when compacted. The layers shall be so placed that when compacted they will be true to the grades or levels required with the least possible surface disturbance. Where the ABC is placed in more than one layer, the previously constructed layers shall be cleaned of loose and foreign matter by sweeping with power sweepers, power brooms, or hand brooms, as directed. Such adjustments in placing procedures or equipment shall be made as may be directed to obtain true grades, to minimize segregation and degradation, to adjust the water content, and to insure an acceptable ABC.

C. Grade Control: The finished and completed ABC shall conform to the lines, grades, and cross sections shown on the contract drawings. Underlying material(s) shall be excavated and prepared at sufficient depth for the required ABC thickness so that the finished ABC with the subsequent surface course will meet the designated grades.

D. Compaction: Each layer of the ABC shall be compacted as specified with approved compaction equipment. Water content shall be maintained during the compaction procedure to within plus or minus 3 percent of the optimum water content determined from laboratory tests as specified in paragraph SAMPLING AND TESTING. Rolling shall begin at the outside edge of the surface and proceed to the center, overlapping on successive trips at least one-half the width of the roller. Alternate trips of the roller shall be slightly different lengths. Speed of the roller shall be such that displacement of the aggregate does not occur. In all places not accessible to the rollers, the mixture shall be compacted with hand-operated power tampers. Compaction shall continue until each layer has a degree

of compaction that is at least 95 percent of laboratory maximum density through the full depth of the layer. The Contractor shall make such adjustments in compacting or finishing procedures as may be directed to obtain true grades, to minimize segregation and degradation, to reduce or increase water content, and to ensure a satisfactory ABC. Any materials that are found to be unsatisfactory shall be removed and replaced with satisfactory material or reworked, as directed, to meet the requirements of this specification.

E. Thickness: Compacted thickness of the aggregate course shall be as indicated on the drawings. No individual layer shall exceed 6 inches nor be less than 3 inches in compacted thickness. The total compacted thickness of the ABC course shall be within 1/2 inch of the thickness indicated. Where the measured thickness is more than 1/2 inch deficient, such areas shall be corrected by scarifying, adding new material of proper gradation, re-blading, and re-compacting as directed. Where the measured thickness is more than 1/2 inch thicker than indicated, the course shall be considered as conforming to the specified thickness requirements. Average job thickness shall be the average of all thickness measurements taken for the job, but shall be within 1/4 inch of the thickness indicated.

F. Finishing: The surface of the top layer of ABC shall be finished after final compaction by cutting any overbuild to grade and rolling with a steel-wheeled roller. Thin layers of material shall not be added to the top layer of base course to meet grade. If the elevation of the top layer of ABC is 1/2 inch or more below grade, then the top layer should be scarified to a depth of at least 3 inches and new material shall be blended in and compacted to bring to grade. Adjustments to rolling and finishing procedures shall be made as directed to minimize segregation and degradation, obtain grades, maintain moisture content, and insure an acceptable base course. Should the surface become rough, corrugated, uneven in texture, or traffic marked prior to completion, the unsatisfactory portion shall be scarified, reworked and re-compacted or it shall be replaced as directed.

G. Smoothness: The surface of the top layer shall show no deviations in excess of 3/8 inch when tested with a 10 foot straightedge. Measurements shall be taken by the contractor, and observed by the Owner, in successive positions parallel to the centerline of the area to be paved. Measurements shall also be taken perpendicular to the centerline at 100 foot intervals. Deviations exceeding this amount shall be corrected by removing material and replacing with new material, or by reworking existing material and compacting it to meet these specifications.

## 3.05 TRAFFIC

A. Traffic shall not be allowed on the completed ABC course.

## 3.06 MAINTENANCE

A. The ABC shall be maintained in a satisfactory condition until the full pavement section is completed and accepted. Maintenance shall include immediate repairs to any defects and shall be repeated as often as necessary to keep the area intact. Any ABC that is not paved over prior to the onset of winter, shall be retested to verify that it still complies with the requirements of this specification. Any area of ABC that is damaged shall be reworked or replaced as necessary to comply with this specification.

## 3.07 DISPOSAL OF UNSATISFACTORY MATERIALS

A. Any unsuitable materials that must be removed shall be disposed of as directed. No additional payments will be made for materials that must be replaced.

## PART 4 MEASUREMENT AND PAYMENT

Not used.

**END OF SECTION**

# SECTION 02742

# HOT MIX BITUMINOUS PAVEMENT

## PART 1 GENERAL

### 1.01 REFERENCES

A. ASPHALT INSTITUTE (AI) MS-2 - (1994) Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types

B. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) STM C 29/C 29M - (1991; Rev. A) Unit Weight and Voids in Aggregate

C. ASTM C 88 - (1990) Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate

D. ASTM C 117 - (1995) Materials Finer than 75-Micrometer (No. 200) Sieve in Mineral Aggregates by Washing

E. ASTM C 127 - (1988; R 1993) Specific Gravity and Absorption of Coarse Aggregate

F. ASTM C 128 - (1993) Specific Gravity and Absorption of Fine Aggregate

G. ASTM C 131 - (1996) Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

H. ASTM C 136 - (1996; Rev. A) Sieve Analysis of Fine and Coarse Aggregates

I. ASTM C 188 - (1995) Density of Hydraulic Cement

J. ASTM D 70 - (1982; R 1990) Specific Gravity of Semi-Solid Bituminous Materials

K. ASTM D 75 - (1987; R 1992) Sampling Aggregates

L. ASTM D 242 - (1995) Mineral Filler for Bituminous Paving Mixtures

M. ASTM D 546 - (1994) Sieve Analysis of Mineral Filler for Road and Paving Materials

N. ASTM D 692 - (1994; Rev. A) Coarse Aggregate for Bituminous Paving Mixtures

O. ASTM D 854 - (1992) Specific Gravity of Soils

P. ASTM D 979 - (1996) Sampling Bituminous Paving Mixtures

Q. ASTM D 995 - (1995; Rev. B) Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures

R. ASTM D 1073 - (1994) Fine Aggregate for Bituminous Paving Mixtures

S. ASTM D 1075 - (1996) Effect of Water on Cohesion of Compacted Bituminous Mixtures

T. ASTM D 1188 - (1996) Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Paraffin-Coated Specimens

U. ASTM D 1559 - (1989) Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus

V. ASTM D 2041 - (1995) Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures

W. ASTM D 2172 - (1995) Quantitative Extraction of Bitumen from Bituminous Paving Mixtures

X. ASTM D 2726 - (1996; Rev. A) Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures

Y. ASTM D 3381- (2002) Viscosity-Graded Asphalt Cement for Use in Pavement Construction

Z. STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION (CDT) SS-39 - (1992) Standard Specifications - Section 39 - Asphalt Concrete

AA. STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION (CDT) SP- (2006) Standard Plan – A87B - Asphalt Concrete Dikes

## 1.02 GENERAL REQUIREMENTS

A. The Work generally consists of asphalt concrete paving and asphalt concrete dike construction. Areas to receive hot mix bituminous pavement and asphalt dike locations are shown on the drawings.

## 1.03 SUBMITTALS

A. Submit the following in accordance with Section 01330, SUBMITTAL PROCEDURES:

1. Waybills and Delivery Tickets: Certified waybills and delivery tickets for all aggregates, bituminous, and cementitious materials actually used.

2. Job-mix formula Design Data: Submit a job-mix formula, prepared within one year of submittal, for approval by the Owner prior to preparing and placing the bituminous mixture. Design mix using procedures contained in Chapter V, Marshall Method of Mix Design, of AI MS-2. Formulas shall indicate physical properties of the mixes as shown by tests made by a commercial laboratory approved by the Owner, using materials identical to those to be provided on this project. Submit formulas with material samples. Job-mix formula for each mixture shall be in effect until modified in writing by the Contractor and approved by the Owner. Provide a new job-mix formula for each source change.

3. Test Reports: Copies of all test results for bituminous materials, within 24 hours of completion of tests. Certified copies of the manufacturer's test reports indicating compliance with applicable specified requirements, not less than 30 days before the material is required in the work.

   a. Specific gravity test of asphalt
   b. Coarse aggregate tests
   c. Weight of slag test
   d. Percent of crushed pieces in gravel
   e. Fine aggregate tests
   f. Specific gravity of mineral filler
   g. Bituminous mixture tests
   h. Aggregates tests
   i. Bituminous mix tests
   j. Pavement courses

## 1.04 QUALITY ASSURANCE

A. Required Data: Job-mix formula shall show the following:

1. Source and proportions, percent by weight, of each ingredient of the mixture;

2. Correct gradation, the percentages passing each size sieve listed in the specifications for the mixture to be used, for the aggregate and mineral filler

from each separate source and from each different size to be used in the mixture and for the composite mixture;

3. Amount of material passing the No. 200 sieve determined by dry sieving;

4. Number of blows of hammer compaction per side of molded specimen;

5. Temperature viscosity relationship of the asphalt cement;

6. Stability, flow, percent voids in mineral aggregate, percent air voids, unit weight;

7. Asphalt absorption by the aggregate;

8. Effective asphalt content as percent by weight of total mix;

9. Temperature of the mixture immediately upon completion of mixing;

10. Asphalt viscosity grade; and

11. Curves for the wearing course.

B. Plot and submit, on a grain size chart, the specified aggregate gradation band, the job-mix gradation and the job-mix tolerance band.

C. Base selection on percent of total mix and the average of values at the following points on the curves for each mix:

1. Stability: Peak

2. Unit Weight: Peak

3. Percent Air Voids: Median

## 1.05 DELIVERY, STORAGE, AND HANDLING

A. Inspect materials delivered to the site for damage and store with a minimum of handling. Store aggregates in such a manner as to prevent segregation, contamination, or intermixing of the different aggregate sizes.

## 1.06 ENVIRONMENTAL CONDITIONS

A. Place bituminous mixture only during dry weather and on dry surfaces. Place courses only when the surface temperature of the underlying course is greater than

45 degrees F for course thicknesses greater than one inch and 55 degrees F for course thicknesses one inch or less.

## 1.07 PLANT, EQUIPMENT, MACHINES AND TOOLS

A. Spreading equipment shall conform to the requirements of CDT SS-39 paragraph SPREADING EQUIPMENT.

B. Compacting equipment shall conform to the requirements of CDT SS-39 paragraph COMPACTING EQUIPMENT.

## 1.08 CONSTRUCTION EQUIPMENT

A. Paving Equipment

1. Spreading Equipment: Self-propelled electronically controlled type, unless other equipment is authorized by the Owner. Equip spreading equipment of the self-propelled electronically controlled type with hoppers, tamping or vibrating devices, distributing screws, electronically adjustable screeds, and equalizing devices. Capable of spreading hot bituminous mixtures without tearing, shoving, or gouging and to produce a finished surface of specified grade and smoothness. Operate spreaders, when laying mixture, at variable speeds between 5 and 45 feet per minute. Design spreader with a quick and efficient steering device; a forward and reverse traveling speed; and automatic devices to adjust to grade and confine the edges of the mixture to true lines. The use of a spreader that leaves indented areas or other objectionable irregularities in the fresh laid mix during operations is prohibited.

2. Compacting Equipment: Compacting equipment shall conform to the requirements of CDT SS-39 paragraph COMPACTING EQUIPMENT.

3. Hand Tampers: Minimum weight of 25 pounds with a tamping face of not more than 50 square inches.

4. Mechanical Hand Tampers: Commercial type, operated by pneumatic pressure or by internal combustion.

# PART 2 PRODUCTS

## 2.01 AGGREGATES

A. Aggregate for hot mix bituminous paving shall conform to the requirements in CDT SS 39-2.02.

B. Asphalt for hot mix bituminous paving shall conform to the requirements in CDT SS 39-2.01.

## 2.02 ASPHALT CEMENT

A. Asphalt cement for asphalt paving shall conform to ASTM D 3381, viscosity Grade AR-4000.

B. Asphalt cement for asphalt dikes shall be AR8000 paving asphalt with

## 2.03 GRADATION OF AGGREGATES

A. Aggregate for asphalt paving shall conform to the requirements of CDT SS 39-2 for 1/2 inch max surface course aggregate.

B. Aggregate for asphalt dike shall be Type B 3/8-inch maximum, medium grading.

## 2.04 QUANTITY OF BITUMINOUS MATERIAL

A. The amount of asphalt to be used for the specified gradation shall be 5-9 percent by weight of the dry aggregate.

## 2.05 COMPOSITION OF MIXTURE

A. Gradation of mineral aggregate shall be as specified herein. The percentage of bituminous material provided in the bituminous mixtures shall be within the limits specified. Mixtures shall have the following physical properties:

| Test Property | Values |
|---|---|
| Stability Flow | Not less than 1000 pounds |
| (0.01 inch) | Not more than 20 nor less than 8 |
| Percent Air Voids | Not less than 3 nor more than 5 |
| Percent Voids in Mineral Aggregates | See Table 02742-1 |

TABLE 02742-1
MINIMUM PERCENT VOIDS IN MINERAL AGGREGATE (VMA)

| | | |
|---|---|---|
| U.S.A. Standard | Nominal Maximum | Minimum VMA |
| Sieve Designation | Particle Size, In. | Percent |
| No. 4 | 0.187 | 18 |
| 3/8 inch | 0.375 | 16 |
| 1/2 inch | 0.500 | 15 |
| 3/4 inch | 0.750 | 14 |
| 1 inch | 1.000 | 13 |

B. The bituminous concrete mix may contain a maximum of 25 percent (by weight of the total aggregate material) reclaimed asphalt pavement (RAP). The mix design shall meet the requirements for the type of bituminous concrete specified. Clearly state the viscosity of the reclaimed asphalt cement, the grade of new asphalt cement, the properties of the recycling agent (if used) and the percentage of each in the mix. Combine the asphalts and recycling agents to achieve a viscosity of 2000 + 400 poises at 140 degrees F. Finish a new job mix formula for each change in the percentage of RAP material used.

## 2.06 INDEX OF RETAINED STRENGTH

A. ASTM D 1075, 75 or greater.

## 2.07 VARIATIONS FROM FORMULA

A. Variations from the approved job-mix formula shall not exceed the following, and in no case shall the job-mix formula, with tolerances applied, fall outside the general limits for aggregate gradation and bituminous material specified herein:

| TABLE 02742-2 | |
|---|---|
| Aggregate | Tolerance (Plus or Minus) |
| 1/2 inch and larger | 8 percent |
| 3/8 and No. 4 | 7 percent |
| Nos. 8 and 16 | 6 percent |
| Nos. 30 and 50 | 5 percent |
| No. 100 | 4 percent |
| No. 200 | 3 percent |
| Asphalt Cement | 0.5 percent |
| Temperature of Mixture as discharged | 20 degrees F |

## 2.08 SOURCE QUALITY CONTROL

A. Use materials for testing that are identical to materials to be provided in this project. Employ a commercial laboratory approved by the Owner to perform testing.

B. Tests

1. Perform testing in accordance with the following:

a. Specific Gravity Test of Asphalt: ASTM D 70.

b. Coarse Aggregate Tests:

(1) Bulk Specific Gravity: ASTM C 127.

(2) Abrasion Loss: ASTM C 131.

(3) Soundness Loss: ASTM C 88.

c. Weight of Slag Test: ASTM C 29/C 29M.

d. Percent of Crushed Pieces in Gravel: Count by observation and weight.

e. Fine Aggregate Tests:

(1) Bulk Specific Gravity: ASTM C 128.

(2) Soundness Loss: ASTM C 88.

f. Specific Gravity of Mineral Filler: ASTM C 188 or ASTM D 854.

g. Bituminous Mixture Tests:

(1) Bulk Specific Gravity: ASTM D 1188 or ASTM D 2726.

(2) Theoretical Maximum Specific Gravity: ASTM D 2041.

(3) Index of Retained Strength: ASTM D 1075.

C. Specimens

1. ASTM D 1559 for the making and testing of bituminous specimens with the following exceptions:

a. Compaction: Apply 75 blows of the hammer to each flat face of the specimens.

b. Curves: Plot curves for the wearing courses to show the effect on the test properties of at least four different percentages of asphalt on the unit weight, stability, flow, air voids, and voids in mineral aggregate; each point on the curves shall represent the average of at least four specimens.

c. Cooling of Specimen: After compaction is completed, allow the specimen to cool in air to the same temperature approximately as that of the water, 77 degrees F, to be used in the specific gravity determination.

## PART 3 EXECUTION

### 3.01 PREPARATION

A. The mineral aggregates and asphalt binder shall be mixed at a central mixing plant and shall be in accordance with CDT SS-39 paragraph PROPORTIONING.

B. Transport bituminous material from the mixing plant to the paving site in trucks having tight, clean, smooth beds that have been coated with a minimum amount of concentrated solution of hydrated lime and water or other approved coating to prevent adhesion of the mixture to the truck. Petroleum products will not be permitted for coating truck. If air temperature is less than 60 degrees F or if haul time is greater than 30 minutes, cover each load with canvas or other approved

material of ample size to protect the mixture from the loss of heat. Make deliveries so that the spreading and rolling of all the mixture prepared for one day's run can be completed during daylight, unless adequate approved artificial lighting is provided. Deliver mixture to area to be paved so that the temperature at the time of dumping into the spreader is within the range specified herein. Reject loads that are below minimum temperature, that have crusts of cold unworkable material, or that have been wet excessively by rain. Hauling over freshly laid material is prohibited.

C. Prior to the laying of the asphalt concrete, clean underlying course of foreign or objectionable matter with power blowers or power brooms, supplemented by hand brooms and other cleaning methods where necessary. During the placement of multiple lifts of bituminous concrete, each succeeding lift of bituminous concrete shall have its underlying lift cleaned and provided with a bituminous tack coat if the time period between the placements of each lift of bituminous concrete exceeds 14 days, or the underlying bituminous concrete has become dirty. Remove grass and other vegetative growth from existing cracks and surfaces.

D. Spray contact surfaces of previously constructed pavement with a thin coat of bituminous materials to act as an anti-stripping agent conforming to Section 02748, "Bituminous Tack and Prime Coats." Paint contact surfaces of structures with a thin coat of emulsion or other approved bituminous material prior to placing the bituminous mixture. Tack coat the previously placed primed coats on base courses when surface has become excessively dirty and cannot be cleaned or when primed surface has cured to the extent that it has lost all bonding effect.

## 3.02 PLACEMENT

A. Spreading shall be in accordance to CDT SS 39-6 SPREADING AND COMPACTING and 39-7 MISSELLANEOUS.

B. Shovelers and rakers shall follow the spreading machine. Add or remove hot mixture and rake the mixture as required to obtain a course that when completed will conform to requirements specified herein. Broadcasting or fanning of mixture over areas being compacted is prohibited. When segregation occurs in the mixture during placing, suspend spreading operation until the cause is determined and corrected. Correct irregularities in alignment left by the spreader by trimming directly behind the machine. Immediately after trimming, compact edges of the course by tamping laterally with a metal lute or by other approved methods. Distortion of the course during tamping is prohibited.

C. In areas where the use of machine spreading is impractical, spread mixture by hand. The range of temperatures of the mixtures when dumped onto the area to be paved shall be between 285 and 300 degrees F. Mixtures having temperatures less than minimum spreading temperature when dumped onto the area to be paved

will be rejected. Spread hot mixture with rakes in a uniformly loose layer of a thickness that, when compacted, will conform to the required grade, thickness, and smoothness. During hand spreading, place each shovelful of mixture by turning the shovel over in a manner that will prevent segregation. Do not place mixture by throwing or broadcasting from a shovel. Do not dump loads any faster than can be properly handled by the shovelers and rakers.

## 3.03 COMPACTION OF MIXTURE

A. Compaction shall be performed in accordance with CDT SS 39-6 SPREADING AND COMPACTING.

## 3.04 JOINTS

A. Joints shall present the same texture and smoothness as other portions of the course, except permissible density at the joint may be up to 2 percent less than the specified course density. Carefully make joints between old and new pavement or within new pavements in a manner to ensure a thorough and continuous bond between old and new sections of the course. Vertical contact surfaces of previously constructed sections that are coated with dust, sand, or other objectionable material shall be painted with a thin uniform coat of emulsion or other approved bituminous material just before placing fresh mixture.

B. Transverse: Roller shall pass over unprotected end of freshly laid mixture only when laying of course is to be discontinued. Except when an approved bulkhead is used, cut back the edge of previously laid course to expose an even, vertical surface for the full thickness of the course. When required, rake fresh mixture against joints, thoroughly tamp with hot tampers, smooth with hot smoothers, and roll. Transverse joints in adjacent lanes shall be offset a minimum of 2 feet.

C. Longitudinal Joints: Space 6 inches apart. Do not allow joints to coincide with joints of existing pavement or previously placed courses. Spreader screed shall overlap previously placed lanes 2 to 3 inches and be of such height to permit compaction to produce a smooth dense joint. With a lute, push back mixture placed on the surface of previous lanes to the joint edge. Do not scatter mix. Remove and waste excess material. When edges of longitudinal joints are irregular, honeycombed, or poorly compacted, cut back unsatisfactory sections of joint and expose an even vertical surface for the full thickness of the course. When required, rake fresh mixture against joint, thoroughly tamp with hot tampers, smooth with hot smoothers, and roll while hot.

## 3.05 FIELD QUALITY CONTROL

A. Perform pavement testing in accordance with CDT SS 6-3 TESTING.

B. Density: For each 1,000 tons of bituminous mixture placed, determine the representative laboratory density by averaging the density of four laboratory specimens prepared in accordance with ASTM D 1559. Samples for laboratory specimens shall be taken from trucks delivering mixture to the site; record in a manner approved by the Owner the project areas represented by the laboratory densities. From each representative area recorded, determine field density of pavement by averaging densities of 4 inch diameter cores obtained from wearing courses; take one core for each 2,000 square yards or fraction thereof of course placed. Determine density of laboratory prepared specimens and cored samples in accordance with ASTM D 1188 or ASTM D 2726, as applicable. Separate pavement layers by sawing or other approved means. Maximum allowable deficiency at any point, excluding joints, shall not be more than 2 percent less than the specified density for any course. The average density of each course, excluding joints, shall be not less than the specified density. Joint densities shall not be more than 2 percent less than specified course densities and are not included when calculating average course densities. When the deficiency exceeds the specified tolerances, correct each such representative area or areas by removing the deficient pavement and replacing with new pavement.

C. Thickness: Determine thickness of wearing courses from samples taken for the field density test. The maximum allowable deficiency at any point shall not be more than 1/4 inch less than the thickness for the indicated course. Average thickness of course or of combined courses shall be not less than the indicated thickness. Where a deficiency exceeds the specified tolerances, correct each such representative area or areas by removing the deficient pavement and replacing with new pavement.

D. Smoothness: Straightedge test the compacted surface of wearing courses as work progresses at intervals not to exceed 1 test per 100 linear feet of roadway or 1 test per 1,000 square yards for parking areas. Apply straightedge parallel with and at right angles to the centerline after final rolling. Unevenness of wearing courses shall not vary more than 1/4 inch in 10 feet; variations in the wearing course shall not vary more than 1/8 inch in 10 feet. Correct each portion of the pavement showing irregularities greater than that specified.

E. Finish grades of each course placed shall not vary from the finish elevations, profiles, and cross sections indicated by more than 1/2 inch. Finished surface of the final wearing course will be tested by running lines of levels at intervals of 25 feet longitudinally and transversely to determine elevations of completed pavement. Within 45 days after completion of final placement, perform a level survey at the specified grid spacing and plot the results on a plan drawn to the same scale as the drawings. Elevations not in conformance with the specified tolerance shall be noted on the plan in an approved manner. The survey shall be performed by a registered land surveyor. Correct deficient paved areas by removing existing

work and replacing with new materials that meet the specifications. Skin patching for correcting low areas is prohibited.

F. Finish Surface Texture of Wearing Course: Visually check final surface texture for uniformity and reasonable compactness and tightness. Final wearing course with a surface texture having undesirable irregularities such as segregation, cavities, pulls or tears, checking, excessive exposure of coarse aggregates, sand streaks, indentations, ripples, or lack of uniformity shall be removed and replaced with new materials.

## 3.06 AC DIKES

A. AC Dikes shall be constructed in accordance with CDT SP A87B ASPHALT CONCRETE DIKES Type A. AC Dikes shall be shaped and compacted with an extrusion machine or other equipment capable of shaping and compacting the material to the required section.

## 3.07 PROTECTION

A. Do not permit vehicular traffic, including heavy equipment, on pavement until surface temperature has cooled to at least 120 degrees F. Measure surface temperature by approved surface thermometers or other satisfactory methods.

# PART 4: MEASUREMENT AND PAYMENT

## 4.01 MEASUREMENT

A. Pavement Replacement – 230 RU unit of measure will be per square foot of pavement installed.

B. Pavement Replacement – 38 RU unit of measure will be per square foot of pavement installed.

C. Pavement Replacement – 207 RU unit of measure will be per square foot of pavement installed.

D. Gorgas Avenue Pavement Replacement unit of measure will be square foot of pavement installed.

E. New Raised Path Along Halleck/Gorgas unit of measure will be lineal foot of new raised path installed along Halleck/Gorgas.

F. New at Grade Path Along Building 230 unit of measure will be lineal foot of new at grade path installed along Building 230.

G. New AC Curb unit of measure will be lineal foot of new AC curb installed along Gorgas and in accordance with Sheet C-121.

## 4.02 PAYMENT

A. Payment will be paid at unit prices stated in the Bid Schedule and shall be based on completed work performed in accordance with the Contract Documents. Separate payment will not be made for Work performed under this Section that does not include specific payment provisions. All non-itemized costs associated with this section shall be included in the unit price for the Work. Payment will constitute full compensation for all labor, equipment, tools, and incidentals necessary to complete the work.

1. Pavement Replacement – 230 RU – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to replace pavement (and underlying Class II AB) in 230 RU in accordance with these specifications.

2. Pavement Replacement – 38 RU – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to replace pavement (and underlying Class II AB) in 38 RU in accordance with these specifications.

3. Pavement Replacement – 207 RU – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to replace pavement (and underlying Class II AB) in 207 RU in accordance with these specifications.

4. Gorgas Avenue Placement Replacement – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to replace pavement (and underlying Class II AB) in the Gorgas Avenue in accordance with these specifications.

5. New Raised Path Along Halleck/Gorgas – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to install a new raised AC pavement path (and underlying Class II AB) in accordance with these specifications.

6. New at Grade Path Along Building 230 – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to install a new at grade AC pavement path (and underlying Class II AB) along Building 230 in accordance with these specifications.

7. New AC Curb – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to install a new AC curb in accordance with these specifications.

**END OF SECTION**

# SECTION 02748

# BITUMINOUS TACK AND PRIME COATS

## PART 1 GENERAL

### 1.01 REFERENCES

A. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) T 40 - (1978; R 1996) Sampling Bituminous Materials

B. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) D 140 - (2001) Sampling Bituminous Materials

C. ASTM D 2995 - (1999) Determining Application Rate of Bituminous Distributors

D. STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION (CDT) SS-94 - (2002) Standard Specifications - Section 94 - Asphaltic Emulsions

### 1.02 SUBMITTALS

A. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

1. Waybills and Delivery Tickets: Waybills and delivery tickets, during progress of the work.

2. Sampling and Testing Reports: Copies of all test results for bituminous materials, within 24 hours of completion of tests. Certified copies of the manufacturer's test reports indicating compliance with applicable specified requirements, not less than 30 days before the material is required in the work.

### 1.03 PAYMENT

A. Separate payment will not be made for work performed under this Section. All costs associated with this Section shall be included in the unit or lump sum prices for the related Work.

## 1.04 PLANT, EQUIPMENT, MACHINES AND TOOLS

A. General Requirements: Plant, equipment, machines and tools used in the work shall be subject to approval and shall be maintained in a satisfactory working condition at all times.

1. Bituminous Distributor: The distributor shall have pneumatic tires of such size and number to prevent rutting, shoving, or otherwise damaging the base surface or other layers in the pavement structure. The distributor shall be designed and equipped to spray the bituminous material in a uniform coverage at the specified temperature, at readily determined and controlled rates with an allowable variation from the specified rate of not more than plus or minus 5 percent, and at variable widths. Distributor equipment shall include a separate power unit for the bitumen pump, full-circulation spray bars, tachometer, pressure gauges, volume-measuring devices, adequate heaters for heating of materials to the proper application temperature, a thermometer for reading the temperature of tank contents, and a hand hose attachment suitable for applying bituminous material manually to areas inaccessible to the distributor. The distributor shall be equipped to circulate and agitate the bituminous material during the heating process.

2. Power Brooms and Power Blowers: Power brooms and power blowers shall be suitable for cleaning the surfaces to which the bituminous coat is to be applied.

## 1.05 WEATHER LIMITATIONS

A. Bituminous coat shall be applied only when the surface to receive the bituminous coat is dry. Bituminous coat shall be applied only when the atmospheric temperature in the shade is 50 degrees F or above and when the temperature has not been below 35 degrees F for the 12 hours prior to application.

# PART 2 PRODUCTS

## 2.01 TACK COAT

A. Emulsified asphalt shall conform to CDT SS-94 Grade SS-1h.

## 2.02 PRIME COAT

A. Emulsified asphalt shall conform to CDT SS-94 Grade SS-1h.

## PART 3 EXECUTION

### 3.01 PREPARATION OF SURFACE

A. Immediately before applying the bituminous coat, all loose material, dirt, clay, or other objectionable material shall be removed from the surface to be treated. The surface shall be dry and clean at the time of treatment.

### 3.02 APPLICATION RATE

A. The exact quantities within the range specified, which may be varied to suit field conditions, will be determined by the Owner.

1. Tack Coat: Bituminous material for the tack coat shall be applied in quantities of not less than 0.05 gallon nor more than 0.15 gallon per square yard of pavement surface.

2. Prime Coat: Bituminous material for the prime coat shall be applied in quantities of not less than 0.15 gallon nor more than 0.40 gallon per square yard of pavement surface.

### 3.03 APPLICATION TEMPERATURE

A. Viscosity Relationship: Asphalt application temperature shall provide an application viscosity between 10 and 60 seconds, Saybolt Furol, or between 20 and 120 centistokes, kinematic. The temperature viscosity relation shall be furnished to the Owner.

B. Temperature Ranges: The viscosity requirements shall determine the application temperature to be used. The following is a normal range of application temperatures:

| | Viscosity Grades |
|---|---|
| AR 4000 | plus 290 degrees F |
| | **Emulsions** |
| SS-1h | 70-160 degrees F |

(These temperature ranges exceed the flash point of the material and care should be taken in their heating.)

## 3.04 APPLICATION

A. General: Following preparation and subsequent inspection of the surface, the bituminous coat shall be applied at the specified rate with uniform distribution over the surface to be treated. All areas and spots missed by the distributor shall be properly treated with the hand spray. Until the succeeding layer of pavement is placed, the surface shall be maintained by protecting the surface against damage and by repairing deficient areas at no additional cost to the Owner. If required, clean dry sand shall be spread to effectively blot up any excess bituminous material. No smoking, fires, or flames other than those from the heaters that are a part of the equipment shall be permitted within 25 feet of heating, distributing, and transferring operations of bituminous material other than bituminous emulsions. All traffic, except for paving equipment used in constructing the surfacing, shall be prevented from using the underlying material, whether primed or not, until the surfacing is completed. The bituminous coat shall conform to all requirements as described herein.

B. Prime Coat: The prime coat will be required if it will be at least seven days before the surfacing (Asphalt cement hot mix concrete) layer is constructed on the underlying (base course, etc.)compacted material. The type of liquid asphalt and application rate will be as specified herein. The Contractor shall protect the underlying from any damage (water, traffic, etc.) until the surfacing is placed. If the Contractor places the surfacing within seven days, the choice of protection measures or actions to be taken is at the Contractor's option. Damage to the underlying material caused by lack of, or inadequate, protection shall be repaired (recompacted or replaced) by approved methods at no additional cost to the Owner. If the Contractor options to use the prime coat, it shall be applied as soon as possible after consolidation of the underlying material. To obtain uniform application of the prime coat on the surface treated at the junction of previous and subsequent applications, building paper shall be spread on the surface for a sufficient distance back from the ends of each application to start and stop the prime coat on the paper. Immediately after application, the building paper shall be removed and destroyed.

C. Tack Coat: Tack coat shall be applied at the locations where areas to be paved are joining adjacent concrete or asphalt surfaces.

## 3.05 CURING PERIOD

A. Following application of the bituminous material and prior to application of the succeeding layer of pavement, the bituminous coat shall be allowed to cure and to obtain evaporation of any volatiles or moisture. Prime coat shall be allowed to cure without being disturbed for a period of at least 48 hours or longer, as may be necessary to attain penetration into the treated course.

## 3.06 FIELD QUALITY CONTROL

A. Samples of the bituminous material used shall be obtained by the Contractor as directed, under the supervision of the Owner. The sample may be retained and tested for compliance with the applicable specified requirements by the Owner at no cost to the Contractor.

## 3.07 SAMPLING AND TESTING

A. Sampling and testing shall be performed by an approved commercial testing laboratory or by facilities furnished by the Contractor. No work requiring testing will be permitted until the facilities have been inspected and approved.

B. Sampling: The samples of bituminous material, unless otherwise specified, shall be in accordance with ASTM D 140 or AASHTO T 40. Sources from which bituminous materials are to be obtained shall be selected and notification furnished the Owner within 15 days after the award of the contract.

C. Calibration Test: The Contractor shall furnish all equipment, materials, and labor necessary to calibrate the bituminous distributor. Calibration shall be made with the approved job material and prior to applying the bituminous coat material to the prepared surface. Calibration of the bituminous distributor shall be in accordance with ASTM D 2995.

D. Trial Applications: Before providing the complete bituminous coat, three lengths of at least 100 feet for the full width of the distributor bar shall be applied to evaluate the amount of bituminous material that can be satisfactorily applied.

1. Tack Coat Trial Application Rate: Unless otherwise authorized, the trial application rate of bituminous tack coat materials shall be applied in the amount of 0.05 gallons per square yard. Other trial applications shall be made using various amounts of material as may be deemed necessary.

2. Prime Coat Trial Application Rate: Unless otherwise authorized, the trial application rate of bituminous materials shall be applied in the amount of 0.25 gallon per square yard. Other trial applications shall be made using various amounts of material as may be deemed necessary.

E. Sampling and Testing During Construction: Quality control sampling and testing shall be performed as required in paragraph FIELD QUALITY CONTROL.

## PART 4: MEASUREMENT AND PAYMENT

Not used.

**END OF SECTION**

# SECTION 02763

# PAVEMENT MARKINGS

## PART 1 GENERAL

### 1.01 REFERENCES

A. STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION (CDT) SP - (2006) Standard Plans

B. CDT SS-84 - (2006) Standard Specifications - Section 84 - Traffic Stripes and Pavement Markings

### 1.02 SUBMITTALS

A. Submit the following in accordance with Section 01330, SUBMITTAL PROCEDURES:

1. Equipment Data

2. Product Data

3. Qualifications

4. Volatile Organic Compound (VOC) Certificate.

### 1.03 DELIVERY AND STORAGE

A. All materials shall be delivered and stored in sealed containers that plainly show the designated name, formula or specification number, batch number, color, date of manufacture, manufacturer's name, and directions, all of which shall be plainly legible at time of use.

### 1.04 EQUIPMENT

A. All machines, tools and equipment used in the performance of the work shall be approved and maintained in satisfactory operating condition. Equipment operating on roads shall display low speed traffic markings and traffic warning lights.

1. Application Equipment shall conform to CDT SS 84.

2. Small markers shall be placed along newly painted lines or freshly placed raised markers to control traffic and prevent damage to newly painted surfaces or displacement of raised pavement markers.

3. Marking Removal Equipment shall be mounted on rubber tires and shall be capable of removing markings from the pavement without damaging the pavement surface or joint sealant. Waterblasting equipment shall be capable of producing an adjustable, pressurized stream of water. Sandblasting equipment shall include an air compressor, hoses, and nozzles. The compressor shall be equipped with traps to maintain the air free of oil and water.

## 1.05 HAND-OPERATED, PUSH-TYPE MACHINES

A. All machines, tools, and equipment used in performance of the work shall be approved and maintained in satisfactory operating condition.

## 1.06 MAINTENANCE OF TRAFFIC

A. Traffic controls shall be as specified in Section 1500 TEMPORARY CONSTRUCTION FACILITIES.

## 1.07 WEATHER LIMITATIONS FOR REMOVAL

A. Pavement surface shall be free of snow, ice, or slush. Surface temperature shall be at least 40 degrees F and rising at the beginning of operations. Operation shall cease during thunderstorms. Operation shall cease during rainfall, except for waterblasting and removal of previously applied chemicals. Waterblasting shall cease where surface water accumulation alters the effectiveness of material removal.

# PART 2 PRODUCTS

## 2.01 CROSS-WALK STRIPES AND PAVEMENT MARKINGS

A. Paints shall conform to CDT SS-84-3, color as indicated (see Sheet C-122, Gorgas Avenue – Plan and Profile for location and paint colors).

B. Thermoplastic shall conform to CDT SS-84-2, color as indicated.

C. Materials shall comply with applicable state and local laws enacted to ensure compliance with Federal Clean Air Standards. Materials shall conform to the restrictions of the Bay Area Air Quality Management District.

## PART 3 EXECUTION

### 3.01 SURFACE PREPARATION

A. Surfaces to be marked shall be thoroughly cleaned before application of the pavement marking material. Surfaces shall be prepared in accordance with CDT SS 84.

### 3.02 APPLICATION

A. Pavement striping and markings shall conform to CDT SP and the Construction Drawings. Locations of pavement marking and cross-walk striping are presented on Sheet C-122, Gorgas Avenue, Plan and Profile.

B. Application shall conform to CDT SS 84.

## PART 4 MEASUREMENT AND PAYMENT

### 4.1 MEASUREMENT

A. Measurement for Pavement Striping and Marking will be on a lump sum basis.

### 4.2 PAYMENT

A. Payment for Pavement Striping and Marking will be to execute all work described in this section.

**END OF SECTION**

# SECTION 03100

# FORMWORK FOR CONCRETE

## PART 1 GENERAL

### 1.01 REFERENCES

A. ACI INTERNATIONAL (ACI) 347R - (1994; R 1999) Guide to Formwork for Concrete

### 1.02 DESIGN REQUIREMENTS

A. The design, engineering, and construction of the formwork shall be the responsibility of the Contractor. The formwork shall be designed for anticipated live and dead loads and shall comply with the tolerances specified in Section 03307 CONCRETE FOR MINOR STRUCTURES, paragraph CONSTRUCTION TOLERANCES. The formwork shall be designed as a complete system with consideration given to the effects of cementitious materials and mixture additives such as fly ash, cement type, plasticizers, accelerators, retarders, air entrainment, and others. The adequacy of formwork design and construction shall be monitored prior to and during concrete placement as part of the Contractor's approved Quality Control Plan.

### 1.03 PAYMENT

A. Separate payment will not be made for work performed under this Section. All costs associated with this Section shall be included in the unit or lump sum prices for the related Work.

### 1.04 SUBMITTALS

A. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

1. Shop Drawings: Drawings and design computations for all formwork required shall be submitted at least 15 days either before fabrication on site or before delivery of prefabricated forms. If reshoring is permitted, the method, including location, order, and time of erection and removal shall also be submitted for review.

2. Product Data: Manufacturer's literature shall be submitted for form coating, and form-lining materials.

3. Test Reports

a. Inspection Test Reports: The Contractor shall submit field inspection reports for concrete forms and embedded items.

b. Formwork Not Supporting Weight of Concrete: If forms are to be removed in less than 24 hours on formwork not supporting the weight of concrete, the evaluation and results of the control cylinder tests shall be submitted to and approved before the forms are removed.

## 1.05 SHOP DRAWINGS

A. The shop drawings and data submitted shall include the type, size, quantity, and strength of all materials of which the forms are made, the plan for jointing of facing panels, details affecting the appearance, and the assumed design values and loading conditions.

# PART 2 PRODUCTS

## 2.01 MATERIALS

A. Forms and Form Liners: Forms and form liners shall be fabricated with facing materials that will produce a finish meeting the specified irregularities in formed surface requirements as defined in ACI 347R.

B. Form Coating: Form coating shall be commercial formulation that will not bond with, stain, cause deterioration, or any other damage to concrete surfaces. The coating shall not impair subsequent treatment of concrete surfaces depending upon bond or adhesion nor impede the wetting of surfaces to be cured with water or curing compounds. If special form liners are to be used, the Contractor shall follow the recommendation of the form coating manufacturer.

## 2.02 ACCESSORIES

A. Ties and other similar form accessories to be partially or wholly embedded in the concrete shall be of a commercially manufactured type. After the ends or end fasteners have been removed, the embedded portion of metal ties shall terminate not less than 2 inches from any concrete surface either exposed to view or exposed to water.

## PART 3 EXECUTION

### 3.01 INSTALLATION

A. Form Construction: Forms shall be constructed true to the structural design and required alignment. The form surface and joints shall be mortar tight and supported to achieve safe performance during construction, concrete placement, and form removal. The Contractor shall continuously monitor the alignment and stability of the forms during all phases to assure the finished product will meet the required surface class or classes specified in paragraph FORMS AND FORM LINERS and tolerances specified in paragraph DESIGN REQUIREMENTS. Failure of any supporting surface either due to surface texture, deflection or form collapse shall be the responsibility of the Contractor as will the replacement or correction of unsatisfactory surfaces. When forms for continuous surfaces are placed in successive units, care shall be taken to fit the forms over the completed surface to obtain accurate alignment of the surface and to prevent leakage of mortar. Forms shall not be re-used if there is any evidence of defects which would impair the quality of the resulting concrete surface. All surfaces of used forms shall be cleaned of mortar and any other foreign material before reuse.

B. Chamfering: All exposed joints, edges and external corners shall be chamfered by molding placed in the forms unless the drawings specifically state that chamfering is to be omitted or as otherwise specified. Chamfered joints shall not be permitted where earth or rockfill is placed in contact with concrete surfaces. Chamfered joints shall be terminated twelve inches outside the limit of the earth or rockfill so that the end of the chamfers will be clearly visible.

C. Coating: Forms for exposed or painted surfaces shall be coated with form oil or a form-release agent before the form or reinforcement is placed in final position. The coating shall be used as recommended in the manufacturer's instructions. Forms for unexposed surfaces may be wet with water in lieu of coating immediately before placing concrete, except that, in cold weather when freezing temperatures are anticipated, coating shall be mandatory. Surplus coating on form surfaces and coating on reinforcing steel and construction joints shall be removed before placing concrete.

### 3.02 FORM SETTING

A. Forms shall be set to the indicated alignment, grade, and dimensions. Forms shall be held rigidly in place by a minimum of 3 stakes per form placed at intervals not to exceed 4 feet. Corners, deep sections, and radius bends shall have additional stakes and braces, as required. Clamps, spreaders, and braces shall be used where required to ensure rigidity in the forms. Forms shall be removed without injuring the concrete. Bars or heavy tools shall not be used against the concrete in removing the forms. Any concrete found defective after form removal shall be

promptly and satisfactorily repaired. Forms shall be cleaned and coated with form oil each time before concrete is placed. Wood forms may, instead, be thoroughly wetted with water before concrete is placed, except that with probable freezing temperatures, oiling is mandatory.

## 3.03 FORM REMOVAL

A. Forms shall not be removed without approval. The minimal time required for concrete to reach a strength adequate for removal of formwork without risking the safety of workers or the quality of the concrete depends on a number of factors including, but not limited to, ambient temperature, concrete lift heights, type and amount of concrete admixture, and type and amount of cementitious material in the concrete. It is the responsibility of the Contractor to consider all applicable factors and leave the forms in place until it is safe to remove them. In any case forms shall not be removed unless the minimum time requirements below are met, except as otherwise directed or specifically authorized. When conditions are such as to justify the requirement, forms will be required to remain in place for a longer period. All removal shall be accomplished in a manner which will prevent damage to the concrete and ensure the complete safety of the structure. Where forms support more than one element, the forms shall not be removed until the form removal criteria are met by all supported elements.

B. Formwork Not Supporting Weight of Concrete: Formwork for walls, columns, sides of beams, gravity structures, and other vertical type formwork not supporting the weight of concrete shall not be removed in less than 24 hours after concrete placement is completed. Form removal before 24 hours will be allowed for simple floor slab, sidewalks, and driveways provided the ambient temperature during this period has not fallen below 50 degrees F at any time since placement.

## 3.04 INSPECTION

A. Forms and embedded items shall be inspected in sufficient time prior to each concrete placement by the Contractor in order to certify to the Owner that they are ready to receive concrete. The results of each inspection shall be reported in writing.

# PART 4 MEASUREMENT AND PAYMENT

Not used.

**END OF SECTION**

**SECTION 03307**

**CONCRETE FOR MINOR STRUCTURES**

## PART 1 GENERAL

### 1.01 REFERENCES

A. ACI INTERNATIONAL (ACI) 347R - (1994; R 1999) Guide to Formwork for Concrete

B. ACI 318 – (2005) Building Code Requirements for Structural Concrete

C. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) C 143/C 143M - (2000) Slump of Hydraulic Cement Concrete

D. ASTM C 172 - (1999) Sampling Freshly Mixed Concrete

E. ASTM C 231 - (1997el) Air Content of Freshly Mixed Concrete by the Pressure Method

F. ASTM C 31/C 31M - (2000e1) Making and Curing Concrete Test Specimens in the Field

G. ASTM C 39/C 39M - (2001) Compressive Strength of Cylindrical Concrete Specimens

H. ASTM D 75 - (1987; R 1997) Sampling Aggregates

I. STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION (CDT) SS-40 - (2006) Standard Specifications - Section 40 - Portland Cement Concrete Pavement

J. CDT SS-90 - (2006) Standard Specifications - Section 90 - Portland Cement Concrete

K. ASTM A 615/A 615M - (1996a) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement F. ASTM A 675/A 675M - (1990a; R 1995e1) Steel Bars, Carbon, Hot-Wrought, Special Quality, Mechanical Properties

L. ASTM A 706/A 706M - (1998) Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement

M. ASTM A 767/A 767M - (1997) Zinc-Coated (Galvanized) Steel Bars in Concrete Reinforcement

N. ASTM A185 – (2001) - Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete

O. ASTM A 775/A 775M - (1997e1) Epoxy-Coated Reinforcement Steel Bars

### 1.02 PAYMENT

A. Separate payment will not be made for Work performed under this Section. All costs associated with this section shall be included in the unit or lump sum prices for the related Work.

## 1.03 SUBMITTALS

A. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

1. Product Data: Manufacturer's literature from suppliers which demonstrates compliance with applicable specifications for the following materials:

   a. Water-Reducing or Retarding Admixture

   b. Curing Materials

   c. Reinforcing Steel.

2. Shop Drawings

   a. Conveying and Placing Concrete: The methods and equipment for transporting, handling, depositing, and consolidating the concrete shall be submitted prior to the first concrete placement.

   b. Formwork: Formwork design shall be submitted prior to the first concrete placement.

   c. Reinforcement: Detail drawings showing reinforcing steel placement, schedules, sizes, grades, and splicing and bending details. Drawings shall show support details including types, sizes and spacing.

3. Test Reports

   a. Aggregate Test Reports: Aggregates will be accepted on the basis of certificates of compliance and test reports that show the material(s) meets the quality and grading requirements of the specifications under which it is furnished.

   b. Concrete Mixture Proportions Test Reports: Ten days prior to placement of concrete, the contractor shall submit the mixture proportions that will produce concrete of the quality required. Applicable test reports shall be submitted to verify that the concrete mixture proportions selected will produce concrete of the quality specified. 28-day compressive strength data for the batch being shipped to the site will be provided to the Owner and the Engineer.

4. Certificates

   a. Cementitious Materials Certificates: Certificates of compliance attesting that the concrete materials meet the requirements of the specifications shall be submitted to the Owner. Cementitious material will be accepted on the basis of a manufacturer's certificate of compliance, accompanied

by mill test reports that the material(s) meet the requirements of the specification under which it is furnished.

## 1.04 DESIGN AND PERFORMANCE REQUIREMENTS

A. The Owner will maintain the option to sample and test aggregates and concrete to determine compliance with the specifications. The Contractor shall provide facilities and labor as may be necessary to assist the Owner in procurement of representative test samples.

1. Construction Tolerances: A Class "C" finish shall apply to all surfaces except those specified to receive a Class "D" finish. A Class "D" finish shall apply to all surfaces which will be permanently concealed after construction. The surface requirements for the classes of finish required shall be as specified in ACI 347R.

2. Concrete Mixture Proportions: Concrete mixture proportions shall be the responsibility of the Contractor. Mixture proportions shall include the dry weights of cementitious material(s); the nominal maximum size of the coarse aggregate; the specific gravities, absorptions, and saturated surface-dry weights of fine and coarse aggregates; the quantities, types, and names of admixtures; and quantity of water per cubic yard of concrete. All materials included in the mixture proportions shall be of the same type and from the same source as will be used on the project. Specified compressive strength f'c shall be 3,000 psi for all applications or as indicated on the drawings at 28 days.

## 1.05 QUALITY ASSURANCE

A. Installer Qualifications: Concrete work shall be finished by firm with five years experience with work of similar scope and quality.

## 1.06 DELIVERY AND STORAGE

A. Concrete, reinforcement and accessories shall be stored off the ground on platforms, skids, or other supports.

# PART 2 PRODUCTS

## 2.01 CONCRETE

A. Concrete shall be Class A, in accordance with CDT SS-90.

## 2.02 FINE AND COARSE AGGREGATE

A. Fine and Coarse aggregates used in concrete shall be in accordance with CDT SS-90-3, Aggregate Gradings.

## 2.03 ADMIXTURES

A. Admixtures used shall be in accordance with CDT SS-90.4, Admixtures.

## 2.04 REINFORCING STEEL

A. Reinforcing steel shall be deformed bars conforming to ASTM A 615/A 615M or ASTM A 706/A 706M, grades and sizes as indicated. In highly corrosive environments or when directed by the Owner, reinforcing steel shall conform to ASTM A 767/A 767M or ASTM A 775/A 775M as appropriate. Welded wire fabric (6x6- 10x10) to be used will be in accordance with ASTM A185.

## 2.05 SIDEWALK REPLACEMENT ON MASON STREET AND DRIVEWAY REPLACEMENT AT TEMPORRARY SEWER PIPE CROSSINGS

A. Sidewalk on Mason Street will be replaced to match existing conditions.

## 2.06 Americans with Disabilities Act (ADA) RAMPS

A. ADA Ramps (on east and west side of Halleck Avenue) will be built in accordance with details on Sheet C-506, Federal Yellow Color Raised Truncated Dome Detectable Warning Surfaces. Specifications from a manufacturer (i.e., Armor-tile or equivalent, (Federal Yellow Color No. 33538)) that supplies the detectable warning surface can be found at the Website (http://www.armor-tile.com/cast_in_place.html).

# PART 3 EXECUTION

## 3.01 PREPARATION

A. SUBGRADE PREPARATION: The subgrade shall be constructed to the specified grade and cross section prior to concrete placement. Subgrade shall be placed and compacted in conformance with Section 02300 EARTHWORK and Section 02720 AGGREGATE BASE COURSE, as applicable.

1. Maintenance of Subgrade: The subgrade shall be maintained in a smooth, compacted condition in conformity with the required section and established grade until the concrete is placed. The subgrade shall be in a moist condition when concrete is placed. The subgrade shall be prepared and protected to produce a subgrade free from frost when the concrete is deposited.

B. General: Construction joints shall be prepared to expose coarse aggregate, and the surface shall be clean, damp, and free of laitance. Ramps and walkways, as necessary, shall be constructed to allow safe and expeditious access for concrete and workmen. Snow, ice, standing or flowing water, loose particles, debris, and foreign matter shall have been removed. Earth foundations shall be satisfactorily compacted. Spare vibrators shall be available. The entire preparation shall be accepted by the Owner prior to placing.

C. Embedded Items: Reinforcement shall be secured in place; joints, anchors, and other embedded items shall have been positioned. Internal ties shall be arranged so that when the forms are removed the metal part of the tie will be not less than 2 inches from concrete surfaces permanently exposed to view or exposed to water on the finished structures. Embedded items shall be free of oil and other foreign matters such as loose

coatings or rust, paint, and scale. The embedding of wood in concrete will be permitted only when specifically authorized or directed by the Owner. All equipment needed to place, consolidate, protect, and cure the concrete shall be at the placement site and in good operating condition.

D. Formwork Installation: Forms shall be properly aligned, adequately supported, and mortar-tight. The form surfaces shall be smooth and free from irregularities, dents, sags, or holes when used for permanently exposed faces. All exposed joints and edges shall be chamfered, unless otherwise indicated. Forms shall be installed in accordance with Section 03100 FORMWORK FOR CONCRETE.

E. Production of concrete shall be in accordance with CDT SS-90.

## 3.02 CONVEYING AND PLACING CONCRETE

A. Conveying and placing concrete shall be in accordance with CDT SS-90.

## 3.03 FINISHING

A. General: No finishing or repair will be done when either the concrete or the ambient temperature is below 50 degrees F.

B. Finishing Formed Surfaces: All fins and loose materials shall be removed, and surface defects including tie holes shall be filled. All honeycomb areas and other defects shall be repaired. All unsound concrete shall be removed from areas to be repaired. Surface defects greater than 1/2 inch in diameter and holes left by removal of tie rods in all surfaces not to receive additional concrete shall be reamed or chipped and filled with dry-pack mortar. The prepared area shall be brush-coated with an approved epoxy resin or latex bonding compound or with a neat cement grout after dampening and filled with mortar or concrete. The cement used in mortar or concrete for repairs to all surfaces permanently exposed to view shall be a blend of Portland cement and white cement so that the final color when cured will be the same as adjacent concrete.

C. Finishing Unformed Surfaces: All unformed surfaces that are not to be covered by additional concrete or backfill shall be float finished to elevations shown, unless otherwise specified. Surfaces to receive additional concrete or backfill shall be brought to the elevations shown and left as a true and regular surface. Finishing shall not be performed while there is excess moisture or bleeding water on the surface. No water or cement shall be added to the surface during finishing.

D. Special Finishes: Special finishes shall be completed as indicated on the Construction Drawings.

## 3.04 TESTS AND INSPECTIONS

A. General: The individuals who sample and test concrete as required in this specification shall have demonstrated a knowledge and ability to perform the necessary test procedures.

B. Inspection Details and Frequency of Testing

1. Preparations for Placing: Forms and embedded items shall be inspected in sufficient time prior to each concrete placement by the Contractor to certify that it is ready to receive concrete.

2. Compressive Strength: Compressive strength shall be checked at least once during each shift that concrete is placed. Each sample will be tested for 7 and 28 days compressive strength.

3. Air Content: Air content shall be checked at least once during each shift that concrete is placed. Samples shall be obtained in accordance with ASTM C 172 and tested in accordance with ASTM C 231.

4. Slump: Slump shall be checked once during each shift that concrete is produced for each class of concrete required. Samples shall be obtained in accordance with ASTM C 172 and tested in accordance with ASTM C 143/C 143M.

5. Consolidation and Protection: The Contractor shall ensure that the concrete is properly consolidated, finished, protected, and cured.

C. Action Required

1. Placing: The Contractor shall not permit placing to begin until he has verified that an adequate number of acceptable vibrators, which are in working order and have competent operators, are available. Placing shall not be continued if any pile is inadequately consolidated.

2. Air Content: Whenever a test result is outside the specification limits, the concrete shall not be delivered to the forms and an adjustment shall be made to the dosage of the air-entrainment admixture.

3. Slump: Whenever a test result is outside the specification limits, the concrete shall not be delivered to the forms and an adjustment should be made in the batch weights of water and fine aggregate. The adjustments are to be made so that the water-cement ratio does not exceed that specified in the submitted concrete mixture proportion.

4. Reports: The results of all tests and inspections conducted at the project site shall be reported informally at the end of each shift and in writing weekly and shall be delivered within 3 days after the end of each weekly reporting period.

## 3.05 REINFORCEMENT

A. Reinforcement shall be fabricated to shapes and dimensions shown and shall conform to the requirements of ACI 318/318R. Reinforcement shall be cold bent unless otherwise authorized. Bending may be accomplished in the field or at the mill. Bars shall not be bent after embedment in concrete. Safety caps shall be placed on all exposed ends of vertical concrete reinforcement bars that pose a danger to life safety. Wire tie ends shall face away from the forms.

1. Placement: Reinforcement shall be free from loose rust and scale, dirt, oil, or other deleterious coating that could reduce bond with the concrete. Reinforcement shall be placed in accordance with ACI 318/318R at locations shown plus or minus one bar diameter. Reinforcement shall not be continuous through expansion joints and shall be as indicated through construction or contraction joints. Concrete coverage shall be as indicated or as required by ACI 318/318R. If bars are moved more than one bar diameter to avoid interference with other reinforcement, conduits or embedded items, the resulting arrangement of bars, including additional bars required to meet structural requirements, shall be approved before concrete is placed.

2. Splicing: Splices of reinforcement shall conform to ACI 318/318R and shall be made only as required or indicated. Splicing shall be by lapping or by mechanical butt connection; except that lap splices shall not be used for bars larger than No. 11 unless otherwise indicated. Lapped bars shall be placed in contact and securely tied or spaced transversely apart to permit the embedment of the entire surface of each bar in concrete. Lapped bars shall not be spaced farther apart than one-fifth the required length of lap or 6 inches. Mechanical butt splices shall be in accordance with the recommendation of the manufacturer of the mechanical splicing device. Butt splices shall develop 125 percent of the specified minimum yield tensile strength of the spliced bars or of the smaller bar in transition splices. Bars shall be flame dried before butt splicing. Adequate jigs and clamps or other devices shall be provided to support, align, and hold the longitudinal centerline of the bars to be butt spliced in a straight line.

## PART 4 MEASUREMENT AND PAYMENT

### 4.01 MEASUREMENT

A. Sidewalk Replacement on Mason Street unit of measure will be per square foot of sidewalk replaced.

B. Driveway Replacement at Temporary Sewer Pipe Crossings will be per square feet of driveway replaced.

C. ADA Ramp on West Side of Halleck Avenue unit of measure will be on a lump sum basis.

D. ADA Ramp on East Side of Halleck Avenue unit of measure will be on a lump sum basis.

### 4.02 PAYMENT

A. Payment will be paid at lump sum or unit prices stated in the Bid Schedule and shall be based on completed work performed in accordance with the Contract Documents. Separate payment will not be made for Work performed under this Section that does not include specific payment provisions. All non-itemized costs associated with this section shall be included in the lump sum or unit price for the Work. Payment will constitute full

compensation for all labor, equipment, tools, and incidentals necessary to complete the work.

1. Sidewalk Replacement on Mason Street – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to replace sidewalk on Mason Street in accordance with these specifications.

2. Driveway Replacement at Temporary Sewer Pipe Crossings – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to replace driveways at locations of temporary sewer pipe crossings in accordance with these specifications.

3. ADA Ramp on West Side of Halleck Avenue – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to install a new ADA ramp on west side of Halleck Avenue in accordance with these specifications.

4. ADA Ramp on East Side of Halleck Avenue – Payment will be for mobilization of personnel, equipment, and all other related items to the Site to install a new ADA ramp on east side of Halleck Avenue in accordance with these specifications.

# SECTION 13285

# REMOVAL AND DISPOSAL OF PCB CONTAMINATED WASTE

## PART 1 GENERAL

### 1.01 REFERENCES

A. ASTM D 4397 - (1996) Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications

B. U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA) 29 CFR 1910.120 - Hazardous Waste Operations and Emergency Response

C. NARA 29 CFR 1910.145 - Accident Prevention Signs and Tags

D. NARA 29 CFR 1910.1000 - Air Contaminants

E. NARA 40 CFR 761.75 - Chemical Waste Landfills

F. NARA 49 CFR 171 - General Information, Regulations, and Definitions

G. NARA 49 CFR 172 - Hazardous Materials, Tables, and Hazardous Materials Communications Regulations

H. NARA 49 CFR 173 - Shipments and Packagings

I. NARA 49 CFR 174 - Carriage by Rail

J. NARA 49 CFR 176 - Carriage by Vessel

K. NARA 49 CFR 177 - Carriage by Public Highway

L. NARA 49 CFR 178 - Shipping Container Specification

M. NARA 49 CFR 179 - Tank Cars

N. EPA SW-846 - (1986) Evaluating Solid Waste (Physical/Chemical Methods)

### 1.02 DEFINITIONS

A. PCB and PCBs (Polychlorinated Biphenyls): 40 CFR 761. PCB and PCBs means any chemical substance that is limited to the biphenyl molecule that has

been chlorinated to varying degrees or any combination of substances, which contain such substance.

B. PCB Contaminated Soil: Soils containing concentrations greater than 10 milligrams per kilogram (mg/kg). PCBs when tested as specified herein.

C. PCB Contaminated Water: Water containing greater than 1.5 parts per billion (ppb) when tested as specified herein.

D. Permissible Exposure Limits (PEL): PEL for PCBs is 3.10 E-08 pounds per cubic feet on an 8-hour time weighted average basis.

## 1.03 DESCRIPTION OF WORK

A. The work might include removal and disposal of PCB contaminated soil. If PCB contaminated soil is encountered during onsite characterization work shall be performed in accordance with 40 CFR 761, 29 CFR 1910.120, and the requirements specified herein. Excavate to the horizontal and vertical limits of the identified PCB contaminated soil and as directed by the Owner or Engineer.

B. Existing Conditions: PCB contaminant levels detected in previous soil investigations range from "not detected" to 1.4 mg/kg. Higher PCB contaminant levels might be encountered.

## 1.04 SUBMITTALS

A. Protection Plan, for Owner approval.

B. Training certification.

C. CIH qualifications, for Owner approval.

D. Shipping documentation.

E. Certificate of Disposal.

## 1.05 PAYMENT

A. Separate payment will not be made for work performed under this Section. All costs associated with this Section shall be included in the unit or lump sum prices for the related Work.

## 1.06 QUALITY ASSURANCE

A. Training: Instruct employees on the dangers of PCB exposure, on respirator use, decontamination, and applicable OSHA and EPA regulations.

B. Certified Industrial Hygienist (CIH): Obtain the services of an industrial hygienist certified by the American Board of Industrial Hygiene to certify training, and determine the need for personnel protective equipment (PPE) in performing PCB impacted soil removal work.

C. Protection Plan: Prepare and submit a protection plan, prepared by the CIH, covering protection of workers and the environment from PCB hazards. Specific protection requirements shall be determined by the CIH and, as a minimum, as specified herein.

D. Training Certification: Submit certificates signed and dated by the CIH and by each employee stating that the employee has received training.

E. CIH Qualifications: Submit the name, address, and telephone number of the industrial hygienist selected to perform the duties in paragraph entitled "Certified Industrial Hygienist." Submit proper documentation that the industrial hygienist is certified, including certification number and date of certification and recertification.

# PART 2 PRODUCTS

## 2.01 PLASTIC SHEETING

A. ASTM D 4397.

# PART 3 EXECUTION

## 3.01 PROTECTION OF WORKERS AND THE ENVIRONMENT

A. Protect workers and the environment from PCB hazards in accordance with the PCB protection plan and, as a minimum, as specified herein.

1. Worker Safety: Workers shall wear and use PPE, as recommended by the industrial hygienist, upon entering a PCB control area. If PPE is not required by the CIH, specify in the Protection Plan. Have available one set of PPE required for use by Owner for inspection of work. Do not delay aid to a seriously injured worker for reasons of decontamination.

2. For areas where PCBs are identified during soil sampling establish PCB Control Areas: Establish a PCB control area to prevent unauthorized entry

of personnel. Rope off area and provide 29 CFR 1910.145 signs at approaches and around perimeter. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before entering the area. Allow only personnel briefed on the elements and trained as specified herein into the area. Do not permit food, drink, or smoking materials in the control area. Smoking is not permitted within 50 feet of the PCB control area. Provide "No Smoking" signs as directed by the Owner.

3. Air Quality: Provide air monitoring, personnel monitoring, and sampling to ensure workers safety as determined by the CIH and as specified herein. As a minimum, sample the air daily at the following locations: at locations being disturbed, within the breathing zone of workers, and at the downwind border of the control area. Measure using instrument capable of detecting airborne PCBs at concentrations below OSHA PEL, or use a direct reading total particulate meter correlated to a worst-case amount of PCBs attached to the particulate. When airborne concentrations exceed PEL at the breathing zone of workers, provide respirators and additional worker protection as dictated in the Site Health and Safety Plan. If airborne concentration exceeds PEL at boundary of control area, immediately stop work and notify the Owner.

## 3.02 PCB SPILL PREVENTION

A. Use appropriate vehicles and operating practices to prevent spillage or leakage of contaminated materials from occurring during operations. Inspect vehicles leaving the contaminated soil removal site to ensure that no contaminated soil adheres to the wheels or undercarriage. Immediately report any spills to the Owner and provide cleanup in accordance with 40 CFR 761, Subpart G.

## 3.03 EXCAVATION PROCEDURES

A. Notify the Owner at least 48 hours prior to the start of excavation of contaminated soils. Use methods and equipment that result in minimal disturbance to remaining soil beyond the excavation limits. Remove and dispose of any material that becomes contaminated as a result of the Contractor's operation at no additional cost to the Owner. Stage operations to minimize the time the contaminated soil is exposed to the weather. Provide protection measures around the area of contaminated soils to divert runoff of water from within the excavation boundaries.

B. Underground Utilities: Location of the existing utilities indicated is approximate and other underground utilities may be present. The Contractor shall verify existing underground facilities information and provide notifications in

accordance with Section 01500 TEMPORARY CONSTRUCTION FACILITIES, paragraph LOCATION OF UNDERGROUND FACILITIES.

C. Dust Control: Maintain strict dust control at all times to prevent dust particles with PCB attached from becoming airborne. Sprinkle or treat the soil at the site and other areas disturbed by operations with dust suppressants or water.

D. Washdown of Solid Material: Remove asphalt pavement, concrete slabs, and structures encountered above or below the ground surface within the excavation limits. Brush to remove soil materials.

E. Excavation Limits: Remove contaminated soil to the horizontal and vertical limits as indicated based on soil sampling prior to excavation. Handle and dispose of material within each of these areas as PCB contaminated. If groundwater is encountered prior to reaching the vertical limits, notify the Owner.

F. Additional Excavations: Where directed, continue excavation horizontal and vertical limits as directed by the Owner or Engineer.

## 3.04 CONTAMINATED WATER

A. Collect wash water: Containerize, sample, and analyze and dispose of as required by regulations.

B. The water flows year round in the 72-inch storm drain located on the Site. Contractor shall make provisions to ensure water in the storm drain does not come in contact with potentially contaminated soils.

## 3.05 COLLECTION AND DISCHARGE OF PCB-CONTAMINATED WATER

A. Furnish labor, materials, and equipment necessary for collecting, and discharging of PCB-contaminated surface and subsurface water in excavations at the site. Conduct excavation operations at the site in a manner that minimizes the amount of surface and subsurface water which may collect in the open excavation. Collect standing surface water in contact with PCB contaminated material.

B. Subsurface Drainage: Remove water by pumping or other methods to prevent softening of surfaces exposed by excavation.

C. Discharge of PCB Contaminated Water: Do not discharge any water until tests results showing water is below PCB contaminated water limits as specified herein. PCB contaminated water exceeding reporting limits is reported in two groundwater samples, 231GW01 and 231GW112, both of which are located in the southeast portion of Building 231, which will demolished prior to excavation. Water from this area will be transferred to a 500 gallon poly tank, which will be

tested for PCB (by EPA Method 8082) in addition to the analytes listed in Permit No. 05-0246, Industrial User Class II wastewater permit. If PCB concentrations exceed the limits identified in this section, then it will be discharged in accordance with 3.06, TRANSPORTATION AND DISPOSAL presented below. Otherwise, it will be discharged to the Trust's sanitary sewer system.

D. Cleanup and Removal of Collection System: Upon completion of work, close and remove from the site the surface water and groundwater collection system. Decontaminate equipment in accordance with the Contractor's Site Health and Safety Plan. Containerize, sample, test, and dispose of carbon, residues, cleaning aids, decontamination liquids, and waste as specified for the contaminated soils.

## 3.06 TRANSPORTATION AND DISPOSAL

A. Furnish labor, materials, and equipment necessary to store, transport, and dispose of PCB contaminated material in accordance with Federal, State, and local requirements. Prepare and maintain waste shipment records and manifests required by the Resource Conservation and Recovery Act (RCRA), U.S. Federal Department of Transportation (DOT), and State transportation department.

B. Transportation: 49 CFR 171, 49 CFR 172, 49 CFR 173, 49 CFR 174, 49 CFR 176, 49 CFR 177, 49 CFR 178 49 CFR 179. Transport PCB contaminated soils in vehicles designed to carry PCB contaminated soils in accordance with Federal and State requirements.

1. Inspect and document vehicles and containers for proper operation and covering. Repair or replace damaged containers.

2. Inspect vehicles and containers for proper markings, manifest documents, and other requirements for waste shipment.

C. Weight Certification: Weigh vehicles transporting PCB contaminated materials at a State-certified weigh scale within at the receiving facility.

D. Shipping Documentation: 40 CFR 761. Before transporting the PCB waste, sign and date the manifest acknowledging acceptance of the PCB waste from the Owner. Return a signed copy to the Owner before leaving the job site. Ensure that the manifest accompanies the PCB waste at all times. Submit transporter certification of notification to EPA of their PCB waste activities and EPA identification numbers. Within 35 days from shipment date, the transporter shall provide a copy of the manifest signed and dated by the disposer.

E. Payment Upon Furnishing Certificate of Disposal of PCBs: Payment will not be made until the certificate of disposal has been furnished to the Owner.

F. Disposal: Dispose of PCB contaminated soils in accordance with 40 CFR 761 at a TSCA regulated landfill meeting the requirements of 40 CFR 761.75. The disposer shall forward a copy of the manifest to the Owner within 30 days of receipt of PCBs.

G. Certificate of Disposal: Submit certificate of disposal to the Owner within 30 calendar days of the date that the disposal of the PCB waste identified on the manifest was completed. Include:

1. The identity of the disposal facility, by name, address, and EPA identification number.

2. The identity of the PCB waste affected by the Certificate of Disposal including reference to the manifest number for the shipment.

3. A statement certifying the fact of disposal of the identified PCB waste, including the date(s) of disposal, and identifying the disposal process used.

4. A certification as defined in 40 CFR 761, Section 3.

## 3.07 CLEANUP

A. Maintain surfaces of the PCB control area free of accumulations of PCBs. Restrict the spread of dust and debris; keep waste from being distributed over work area. Do not remove the PCB control area and warning signs prior to the Owner's approval. Reclean areas showing residual PCBs.

## PART 4 MEASUREMENT AND PAYMENT

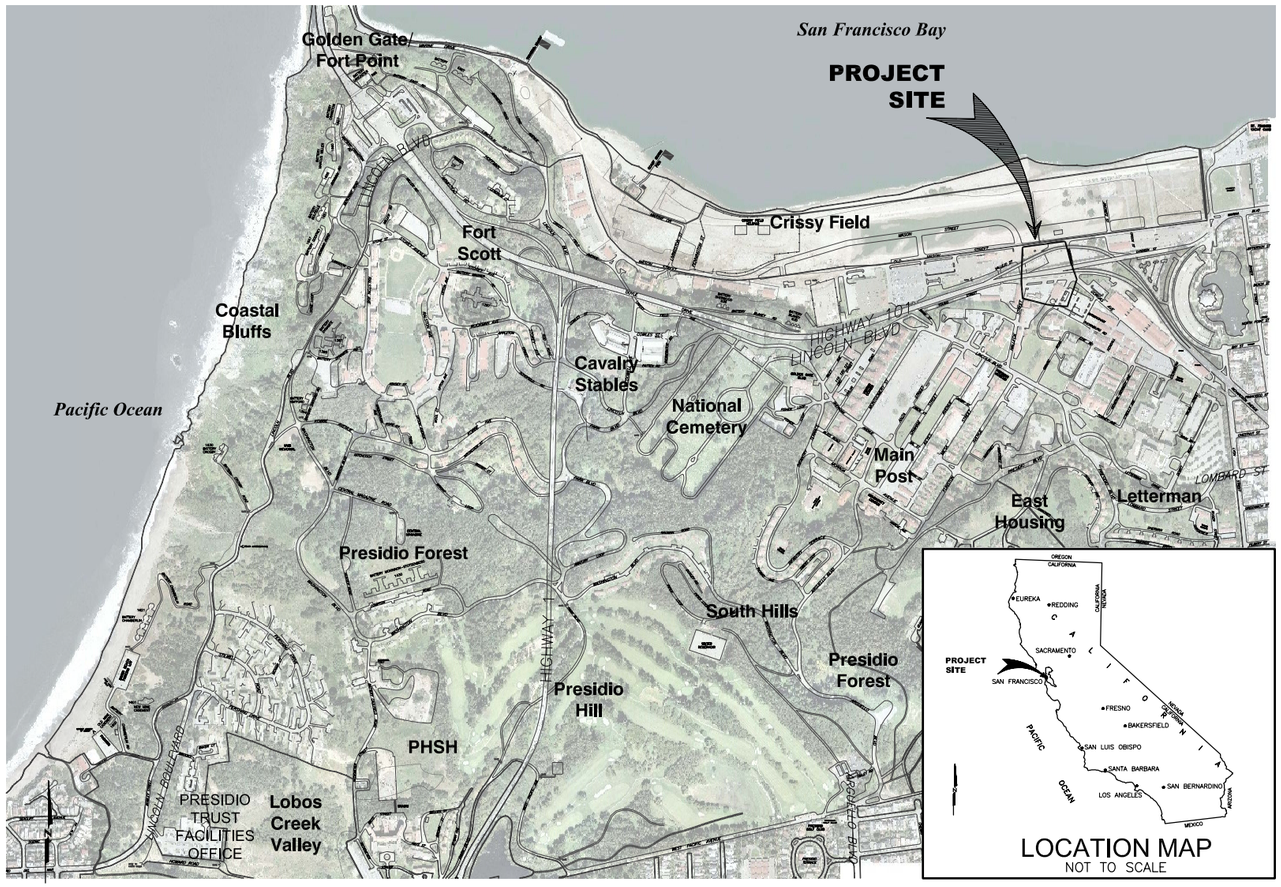
Not used.

**END OF SECTION**

DRAWINGS

# BUILDING 207 / 231 REMEDIATION

PRESIDIO SAN FRANCISCO, CALIFORNIA




PRESIDIO MAP
NOT TO SCALE

LOCATION MAP
NOT TO SCALE

## SHEET INDEX




MACTEC
ENGINEERING & CONSULTING, INC.
28 Second Street, Suite 700
San Francisco, California 94105
(415) 543–8422


REGISTERED PROFESSIONAL ENGINEER
RAMESH RAO
051467
EXP: 06/30/09
CIVIL
STATE OF CALIFORNIA

**BUILDING 207/231 REMEDIATION**

OWNER
PRESIDIO TRUST
34 GRAHAM STREET
P.O. BOX 29052
SAN FRANCISCO, CALIFORNIA
(415) 561 - 5300

THE PRESIDIO TRUST

| NO. | DATE | DESCRIPTION |
|---|---|---|
| | | |
| | | |
| 4 | 10/2008 | FINAL |
| 3 | 7/2008 | REVISED DRAFT |
| 2 | 2/2008 | REVISED DRAFT |
| 1 | 11/2007 | REVISED DRAFT |

PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106001.DWG
DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R .RAO



SHEET TITLE

**TITLE SHEET**

**G-001**
SHEET 1 OF 33

THE PRESIDIO TRUST

## OWNER

**PRESIDIO TRUST**
**34 GRAHAM STREET**
**P.O. BOX 29052**
**SAN FRANCISCO, CALIFORNIA**
**PHONE (415) 561–5300**

## ENGINEER

**MACTEC ENGINEERING & CONSULTING, INC.**
**28 SECOND STREET, SUITE 700**
**SAN FRANCISCO, CALIFORNIA 94105**
**PHONE (415) 543–8422**

DRAWING REDUCED
REFER TO GRAPHIC SCALE

4084075106001.DWG 40.0
20071031.1740

## LEGEND

| FEATURE | PROPOSED | EXISTING |
|---|---|---|
| PERIMETER FENCE | | |
| ASSUMED EXCAVATION AREA | | |
| EXCAVATION CONTROL POINT | EG-1 | |
| SURVEY CONTROL POINT | | 11 MAG WASH |
| TOPOGRAPHIC CONTOUR | 24 | 24 |
| LIMIT OF UPDATED TOPOGRAPHIC MAPPING | | |
| ROAD | | |
| TRANSPORT ROUTE | | |
| WATERLINE | W W | W W |
| WATERLINE VALVE | | |
| FIRE HYDRANT | | |
| STORM DRAIN | SD SD | SD SD |
| STORM DRAIN MAINTENANCE HOLE | | |
| SANITARY SEWER | S S | S S |
| SANITARY SEWER MAINTENANCE HOLE | | |
| UTILITY TO BE DEMOLISHED | | |
| NATURAL GAS LINE | | G G |
| ABANDONED NATURAL GAS LINE | | G(ABAN) |
| COMMUNICATION LINE | | C C C |
| OVERHEAD POWER LINES | | OHE OHE |
| ELECTRIC POWERLINE | | E E |
| POWER POLE | | |
| TRANSFORMER | | |
| SOIL BORING | | |
| SURFACE SOIL SAMPLE | | |
| HISTORIC WALL | | |

| FEATURE | PROPOSED | EXISTING |
|---|---|---|
| ELECTRICAL VAULT | | |
| STREET LIGHT | | |
| DROP INLET | | |
| BOLLARD | | |
| GEOARCHEOLOGICAL TRENCH | | |
| EXISTING AC TO BE REMOVED | | |
| EXISTING STREET SECTIONS TO BE REMOVED<br>NEW AC TRAIL MATCHING EXISTING GRADE | | |
| NEW 6" ELEVATED AC TRAIL WITH CURB | | |

1 / C501 — SECTION OR DETAIL IDENTIFICATION; NUMBER OF SHEET ON WHICH SECTION OR DETAIL IS DRAWN

SURVEY CONTROL POINTS

| POINT | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---|---|---|---|---|
| 11 | 480431.4 | 1435982.1 | 11.24 | MAG WASH |
| 12 | 480645.7 | 1435967.2 | 11.17 | MAG WASH |
| 13 | 480735.0 | 1435707.9 | 10.77 | MAG WASH |
| 14 | 480791.8 | 1436083.1 | 10.69 | MAG WASH |
| 15 | 480528.9 | 1435971.8 | 11.93 | MAG WASH |
| 16 | 480506.6 | 1435976.0 | 11.84 | MAG WASH |
| 20 | 480341.0 | 1436106.7 | 11.64 | MAG WASH |
| 21 | 480502.0 | 1436146.0 | 10.52 | MAG WASH |
| 22 | 480357.4 | 1435722.7 | 19.11 | MAG SHINER |
| 23 | 480231.0 | 1435910.2 | 12.03 | MAG SHINER |
| 24 | 480222.9 | 1436028.8 | 13.59 | MAG SHINER |
| 25 | 480269.8 | 1435704.0 | 21.12 | MAG SHINER |
| 26 | 480202.8 | 1435644.7 | 25.95 | MAG SHINER |
| 27 | 480230.3 | 1435779.5 | 21.02 | MAG SHINER |
| 28 | 480134.8 | 1435841.1 | 20.47 | MAG SHINER |
| 1001 | 480628.9 | 1435973.2 | 11.19 | MAG SK |
| 1002 | 480803.2 | 1436077.4 | 10.45 | FNDPK SHINER |
| MAGNF | 480005.81 | 1435856.17 | 18.52 | Mag Nail |
| MAGNF 105WL | 479877.97 | 1435956.03 | 24.24 | Mag Nail |

## ABBREVIATIONS

| | | | |
|---|---|---|---|
| ± | PLUS OR MINUS | MAX | MAXIMUM |
| & | AND | MIN | MINIMUM |
| | | MH | MANHOLE |
| ABC | AGGREGATE BASE COURSE | N | NORTH |
| ACP | ASBESTOS CEMENT PIPE | (N) | CONSTRUCT NEW WORK |
| AC | ASPHALT CONCRETE | NE | NORTH EAST |
| APPROX | APPROXIMATE | NO | NUMBER |
| ASPH | ASPHALT | NTS | NOT TO SCALE |
| AVE | AVENUE | NW | NORTH WEST |
| BLDG | BUILDING | OC | ON CENTER |
| BGS | BELOW GROUND SURFACE | OD | OVERHEAD |
| BM | BENCH MARK | OHE | OUTSIDE DIAMETER |
| | | OH | OVERHEAD POWER |
| CF | CUBIC FOOT | | |
| CFS | CUBIC FEET PER SECOND | PT | POINT |
| CI | CAST IRON | PP | POWER POLE |
| COMM | COMMUNICATION | | |
| CONC | CONCRETE | Q[MAX] | MAXIMUM FLOW THROUGH PIPE |
| CONST | CONSTRUCT | | |
| CONT | CONTINUE | RCP | REINFORCED CONCRETE PIPE |
| CTR | CENTER | RD | ROAD |
| | | REQ | REQUIRED |
| DI | DROP INLET | R&R | REMOVE AND REPLACE |
| DIP | DUCTILE IRON PIPE | RU | REMEDIAL UNIT |
| DEMO | DEMOLISH | | |
| DET | DETAIL | | |
| DWG | DRAWING | S | SOUTH |
| DWGS | DRAWINGS | SD | STORM DRAIN |
| DECON | DECONTAMINATION | SE | SOUTH EAST |
| | | SHT | SHEET |
| E | EAST | SL | STREET LIGHT |
| (E) | EXISTING FEATURE | SPEC | SPECIFICATION |
| EA | EACH | SS | SANITARY SEWER |
| EL | ELEVATION | SW | SOUTH WEST |
| ELEV | ELEVATION | SSMH | SANITARY SEWER MANHOLE |
| EP | EDGE OF PAVEMENT | STA | STATION |
| | | SDMH | STORM DRAIN MANHOLE |
| FH | FIRE HYDRANT | | |
| FL | FLOW LINE | TEMP | TEMPORARY |
| FT | FOOT/FEET | TYP | TYPICAL |
| GAL | GALVANIZED | U/G | UNDERGROUND |
| GV | GATE VALVE | UG | UNDERGROUND |
| GGNRA | GOLDEN GATE NATIONAL RECREATION AREA | UGP | UNDERGROUND POWER |
| HORIZ | HORIZONTAL | VERT | VERTICAL |
| HDPE | HIGH DENSITY POLYETHYLENE | VCP | VITRIFIED CLAY PIPE |
| HW | HIGHWAY | W | WEST |
| LUC | LAND USE CONTROL | W/ | WITH |
| LTTD | LAND USE CONTROL | W/O | WITHOUT |
| | | WL | WATERLINE |

## GENERAL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING DAMAGE TO EXISTING ROADWAYS CAUSED BY CONSTRUCTION ACTIVITIES. REPAIRS SHALL BE MADE TO MATCH EXISTING CONDITIONS AT NO COST TO THE PRESIDIO TRUST AND TO THE SATISFACTION OF THE OWNER REPRESENTATIVE.

2. APPROXIMATE LOCATION OF ALL KNOWN UTILITIES ARE SHOWN ON THE PLANS. A REASONABLE EFFORT HAS BEEN MADE TO LOCATE AND DELINEATE ALL KNOWN UNDERGROUND UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY UTILITY LOCATIONS AND TO NOTIFY THE RESPECTIVE UTILITY COMPANIES FOR FIELD LOCATION AND VERIFICATION PRIOR TO ANY CONSTRUCTION. THE CONTRACTOR SHALL VERIFY ALL ELEVATIONS OF EXISTING PIPES AND BURIED UTILITIES. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE COMPLETENESS OR ACCURACY OF ITS DELINEATION OF SUCH EXISTING UNDERGROUND UTILITIES WHICH MAY BE ENCOUNTERED, BUT WHICH ARE NOT SHOWN ON THE SURVEY. WHERE EXISTING UTILITY ELEVATIONS ARE IDENTIFIED, THEY SHALL BE VERIFIED IN THE FIELD AT THE LOCATION INDICATED.

3. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE TRAFFIC ACCESS THROUGH OR AROUND THE CONSTRUCTION ACTIVITY AT ALL TIMES. ACCESS SHALL BE COORDINATED WITH AND APPROVED BY THE PRESIDIO TRUST.

4. NO MATERIAL SHALL BE STOCKPILED OR LEFT ON THE ROADS AT ANY TIME DURING CONSTRUCTION.

5. PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL HAVE REVIEWED THE LIMITS AND TYPES OF WORK TO BE PERFORMED WITH THE PROJECT ENGINEER IN THE FIELD.

6. SITE TOPOGRAPHY PROVIDED BY PRESIDIO TRUST AS PERFORMED BY KUCERA INTERNATIONAL INC, 38133 WESTERN PARKWAY, WILLOUGHBY, OH 44094, (440) 975–4230. DATE OF TOPOGRAPHIC AERIAL SURVEY IS MARCH 24, 2000. DATE OF GPS GROUND CONTROL IS APRIL 20, 2000. THE COORDINATES ARE BASED ON NAD 27 CALIFORNIA STATE PLANE – ZONE 3 – U.S. SURVEY FEET. ELEVATIONS ARE BASED ON NAVD 88 – U.S. SURVEY FEET. UPDATED TOPOGRAPHIC MAPPING USEING THE SAME DATUMS WAS PROVIDED BY CHAUDHARY & ASSOC. UNDER SUBCONTRACT TO MACTEC ON APRIL 7, 2005 AS INDICATED. SURVEY CONTROL POINTS FOR THE WORK INCLUDE ALL OF THOSE IDENTIFIED IN THE TABLE ABOVE, THESE POINTS CAN BE FOUND ON DRAWINGS C–101 AND 102.

7. SEE CONTRACT SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING SITE CONDITIONS AND REQUIREMENTS OF WORK.

## DISCLAIMER NOTICE

THE PRESIDIO TRUST AND MACTEC ARE PROVIDING THE ATTACHED MAPS, PHOTOS, GEOGRAPHIC DATA, ELECTRONIC DRAWINGS, AND/OR PAPER DRAWINGS (ANY OR ALL OF WHICH ARE HEREAFTER DESIGNATED AS THE DRAWINGS) FOR YOUR USE. HOWEVER, YOU ARE CAUTIONED THAT THE DRAWINGS ONLY SHOW APPROXIMATE LOCATIONS AND RELATIONSHIPS OF GEOGRAPHIC COORDINATES, STRUCTURES, UTILITY LINES, ROADS, CONTOUR LINES, TOPOGRAPHIC OR OTHER FEATURES REPRESENTED THEREIN. THE PRESIDIO TRUST AND MACTEC DO NOT REPRESENT OR WARRANT IN ANY WAY THAT THE DRAWINGS ARE ACCURATE. THE RECIPIENT OF THE DRAWINGS MUST FIELD VERIFY THEIR ACCURACY PRIOR TO USE. CONTACT THE PRESIDIO PERMIT DEPARTMENT AT 561–4152 FOR EXCAVATION CLEARANCE BEFORE MAKING FIELD VERIFICATION.

BY ACCEPTING THE DRAWINGS, RECIPIENT AGREES TO INDEMNIFY, DEFEND, AND HOLD THE PRESIDIO TRUST AND MACTEC HARMLESS FROM AND AGAINST ANY AND ALL CLAIMS, DAMAGES, LOSSES, LIABILITIES, AND COSTS RELATING IN ANY MANNER TO THE RECIPIENT'S USE, RELIANCE ON, OR DISTRIBUTION OF THE DRAWINGS AND ANY INACCURACIES THEREIN. FURTHERMORE, BY ACCEPTING THE DRAWINGS, THE RECIPIENT AGREES THAT THE PRESIDIO TRUST SHALL NOT BE LIABLE FOR, AND THE RECIPIENT EXPRESSLY ASSUMES THE RISK OF, AND WAIVES, RELEASES, AND DISCHARGES THE PRESIDIO TRUST AND MACTEC FROM, ANY AND ALL CLAIMS, DAMAGES, LOSSES, LIABILITIES, AND COSTS RELATING IN ANY MANNER TO THE RECIPIENT'S USE, RELIANCE ON, OR DISTRIBUTION OF THE DRAWINGS AND ANY INACCURACIES THEREIN. PROVIDED, HOWEVER, THAT THIS ASSUMPTION OF RISK, WAIVER, RELEASE, AND DISCHARGE SHALL NOT APPLY TO EXEMPT ANYONE FROM RESPONSIBILITY FOR HIS OWN FRAUD, OR WILLFUL INJURY TO THE PERSON OR PROPERTY OF ANOTHER, OR VIOLATION OF LAW, WHETHER WILLFUL OR NEGLIGENT.

THE DRAWINGS ARE THE SOLE PROPERTY OF THE PRESIDIO TRUST. THEY MAY NOT BE USED BY ANY PERSON OR IN ANY WAY OTHER THAN AS AUTHORIZED BY THE PRESIDIO TRUST. BY INTENTIONALLY TRANSMITTING THE DRAWINGS TO THE RECIPIENT, THE PRESIDIO TRUST AUTHORIZES USE BY THE RECIPIENT IN THOSE PROJECTS FOR WHICH THE RECIPIENT HAS A BINDING CONTRACT WITH THE PRESIDIO TRUST. THE RECIPIENT IS NOT AUTHORIZED TO USE THE DRAWINGS FOR ANY OTHER PURPOSE. THE RECIPIENT MAY SHARE THE DRAWINGS ONLY WITH OTHER INDIVIDUALS OR ENTITIES WORKING ON THOSE PROJECTS FOR WHICH THE RECIPIENT HAS A BINDING CONTRACT WITH THE PRESIDIO TRUST. IN THE EVENT THAT RECIPIENT MAKES THE DRAWINGS AVAILABLE TO SUCH INDIVIDUALS OR ENTITIES, A COPY OF THIS NOTICE SHALL ACCOMPANY THE DRAWINGS AND BE SIGNED AND EXECUTED BY THAT INDIVIDUAL AND RETURNED TO THE RECIPIENT.

DRAWING REDUCED
REFER TO GRAPHIC SCALE

MACTEC
ENGINEERING & CONSULTING, INC.
28 Second Street, Suite 700
San Francisco, California 94105
(415) 543–8422

REGISTERED PROFESSIONAL ENGINEER — RAMIN SHOMALI — 65467 — EXP: 06/30/09 — CIVIL — STATE OF CALIFORNIA

**BUILDING 207/231 REMEDIATION**

OWNER
PRESIDIO TRUST
34 GRAHAM STREET
P.O. BOX 29052
SAN FRANCISCO, CALIFORNIA
(415) 561 - 5300

THE PRESIDIO TRUST

| NO. | DATE | DESCRIPTION |
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| | | |
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| 4 | 10/2008 | FINAL |
| 3 | 7/2008 | REVISED DRAFT |
| 2 | 2/2008 | REVISED DRAFT |
| 1 | 11/2007 | REVISED DRAFT |

PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106002
DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R .RAO



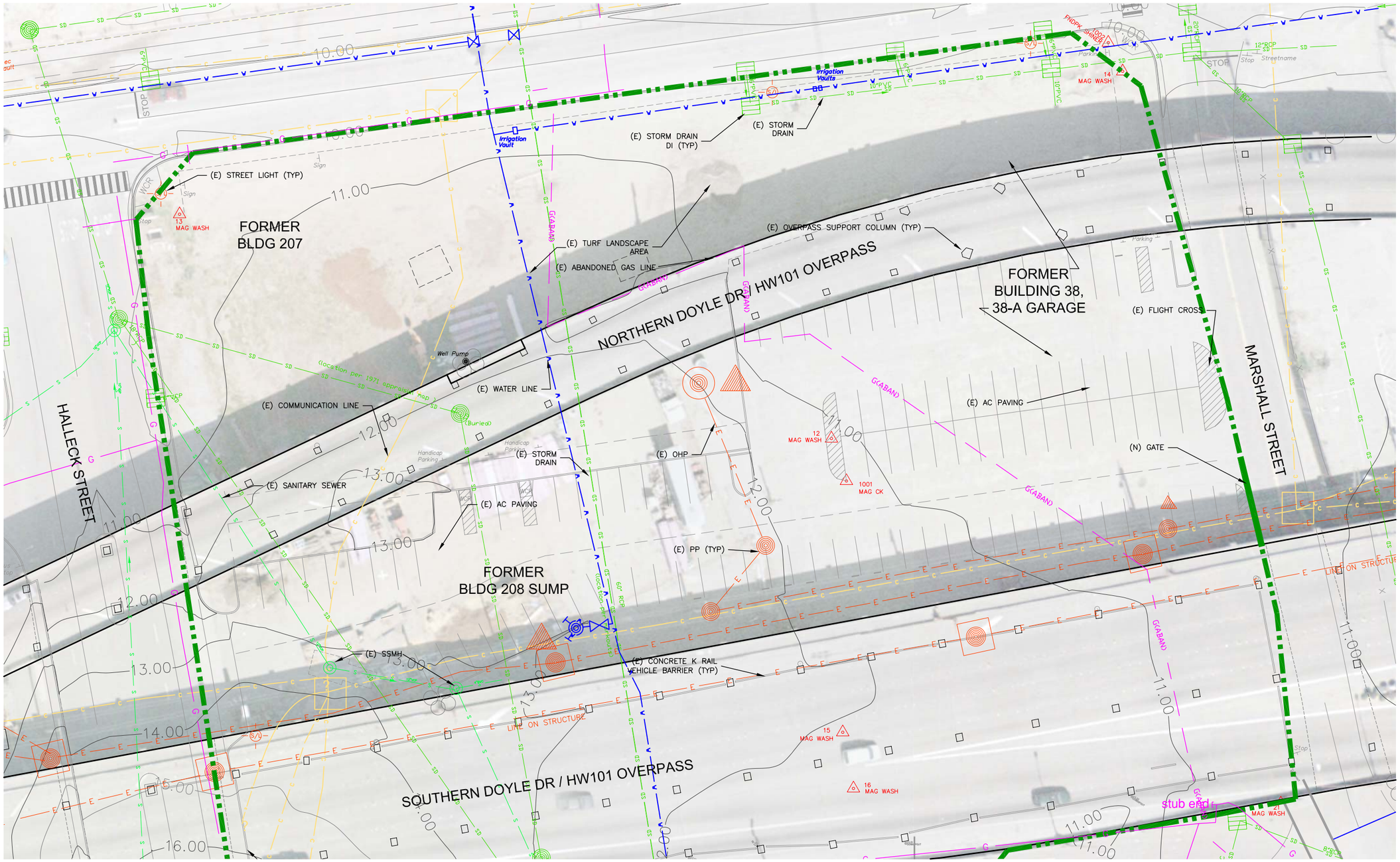
SHEET TITLE

**NOTES, LEGEND, AND ABBREVIATIONS**

**G-002**

SHEET 2 OF 33

4084075106002.DWG 96.0
20081016.1014




NOTES:

1. INSTALL TEMPORARY FENCING AROUND SITE. PROVIDE LOCKABLE GATES FOR INGRESS AND EGRESS.

2. SPECIFIC TEMPORARY CONTROLS FOR SITE CAN BE FOUND ON FIGURE C–103.

N

20 0 20 40

SCALE IN FEET

DRAWING REDUCED
REFER TO GRAPHIC SCALE

MACTEC
ENGINEERING & CONSULTING, INC.
28 Second Street, Suite 700
San Francisco, California 94105
(415) 543–8422

REGISTERED PROFESSIONAL ENGINEER
RYAN T. SHOMAKER
No. 61467
EXP: 06/30/09
CIVIL
STATE OF CALIFORNIA

# BUILDING 207/231 REMEDIATION

OWNER

PRESIDIO TRUST
34 GRAHAM STREET
P.O. BOX 29052
SAN FRANCISCO, CALIFORNIA
(415) 561 - 5300

THE PRESIDIO TRUST

| NO. | DATE | DESCRIPTION |
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| 4 | 10/2008 | FINAL |
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| 2 | 2/2008 | REVISED DRAFT |
| 1 | 11/2007 | REVISED DRAFT |

| | |
|---|---|
| PROJECT NO: | 4084075106 07 |
| CAD DWG FILE: | 4084075106003.dwg |
| DRAWN/DESIGN BY: | J HANZEL-DURBIN |
| CHECKED BY: | R.RAO |

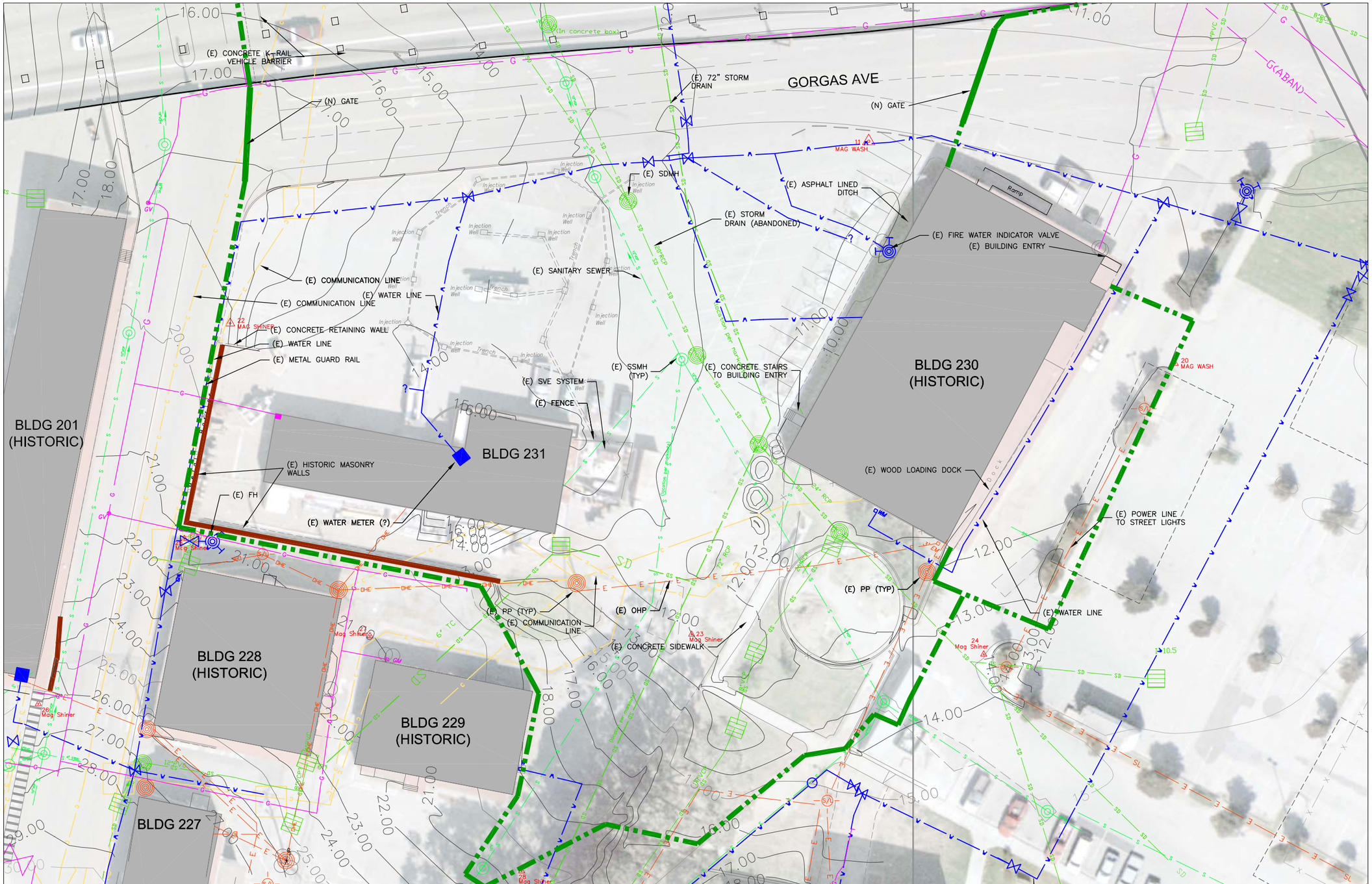


SHEET TITLE

## SITE PLAN NORTH AREA

# C-101

SHEET 3 OF 33




NOTES:

1. INSTALL TEMPORARY FENCING AROUND SITE. PROVIDE LOCKABLE GATES FOR INGRESS AND EGRESS.

2. SPECIFIC TEMPORARY CONTROLS FOR SITE CAN BE FOUND ON FIGURE C-103.

DRAWING REDUCED
REFER TO GRAPHIC SCALE

MACTEC
ENGINEERING & CONSULTING, INC.
28 Second Street, Suite 700
San Francisco, California 94105
(415) 543-8422

REGISTERED PROFESSIONAL ENGINEER RAMESH M. RAO 051467 EXP. 06/30/09 CIVIL STATE OF CALIFORNIA

# BUILDING 207/231 REMEDIATION

OWNER
PRESIDIO TRUST
34 GRAHAM STREET
P.O. BOX 29052
SAN FRANCISCO, CALIFORNIA
(415) 561 - 5300

THE PRESIDIO TRUST

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| 2 | 2/2008 | REVISED DRAFT |
| 1 | 11/2007 | REVISED DRAFT |

PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106003.DWG
DRAWN/DESIGN BY: J HANZEL-DURBIN
CHECKED BY: R.RAO



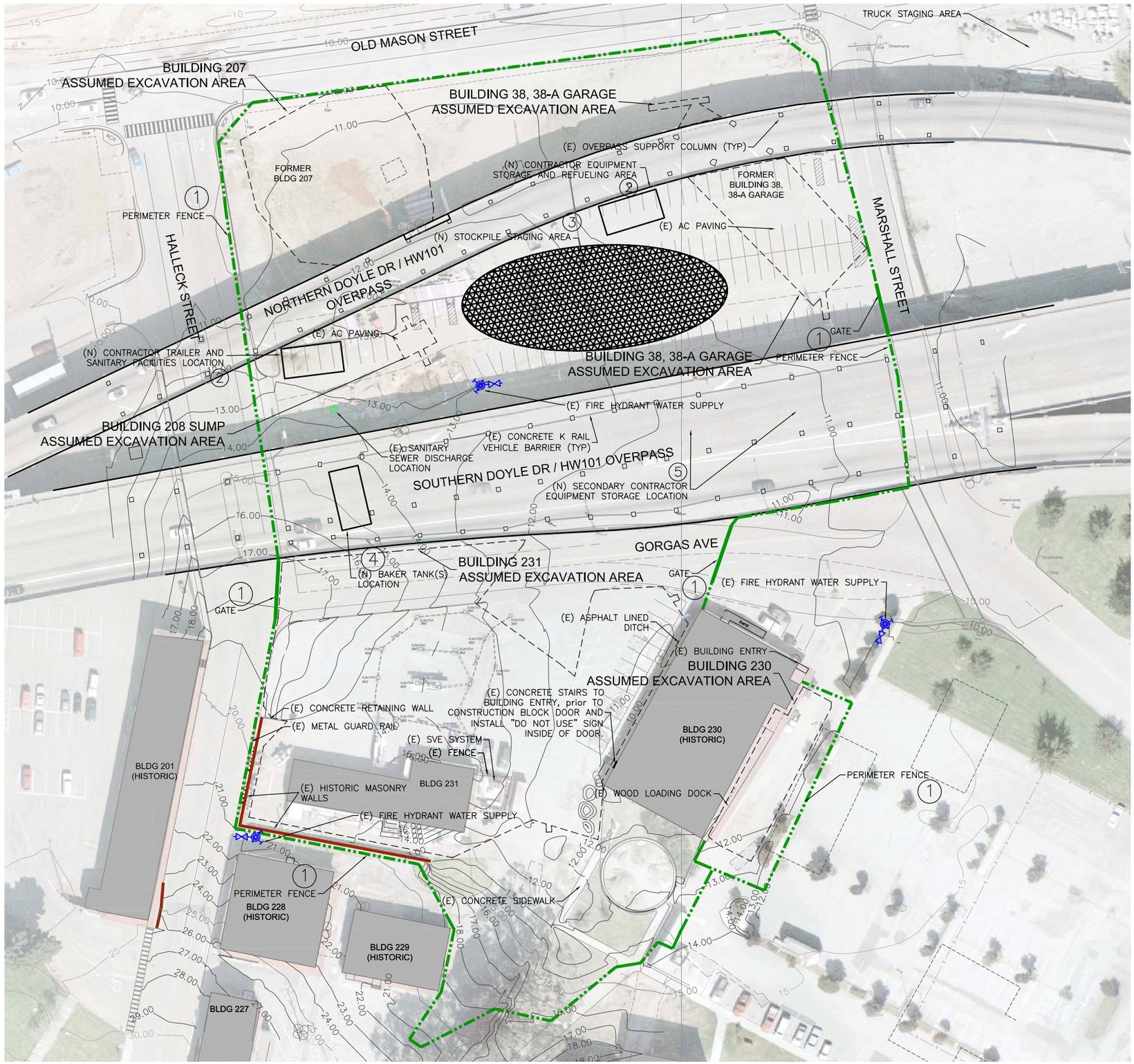
SHEET TITLE

## SITE PLAN SOUTH AREA

## C-102

SHEET 4 OF 33

4084075106003.DWG 96.0
20070919.1410




NOTES:

1. INSTALL TEMPORARY FENCING AROUND SITE. PROVIDE LOCKABLE GATES FOR INGRESS AND EGRESS.

2. CONTRACTOR TO PROVIDE ADEQUATE EQUIPMENT STORAGE, REFUELING, TRAILER, AND SANITARY FACILITY LOCATIONS ONSITE.

3. CONTRACTOR TO PROVIDE SUITABLE CONTROLS FOR STOCKPILE AREA (STRAW WATTLE, PLASTIC GROUND COVER, AND TARP).

4. CONTRACTOR TO USE LOCATION SHOWN TO STAGE BAKER TANK(S).

5. SECONDARY LOCATION FOR CONTRACTOR TO STORE EQUIPMENT ONSITE IF OTHER AREAS ARE NOT ADEQUATE.

MACTEC
ENGINEERING & CONSULTING, INC.
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San Francisco, California 94105
(415) 543-8422

REGISTERED PROFESSIONAL ENGINEER
RAMESH RAO
No. 051467
EXP. 06/30/09
CIVIL
STATE OF CALIFORNIA

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|---|---|
| PROJECT NO: | 4084075106 07 |
| CAD DWG FILE: | 4084075106004.DWG |
| DRAWN/DESIGN BY: | J HANZEL-DURBIN |
| CHECKED BY: | R.RAO |



N

35 0 35 70
SCALE IN FEET

DRAWING REDUCED
REFER TO GRAPHIC SCALE

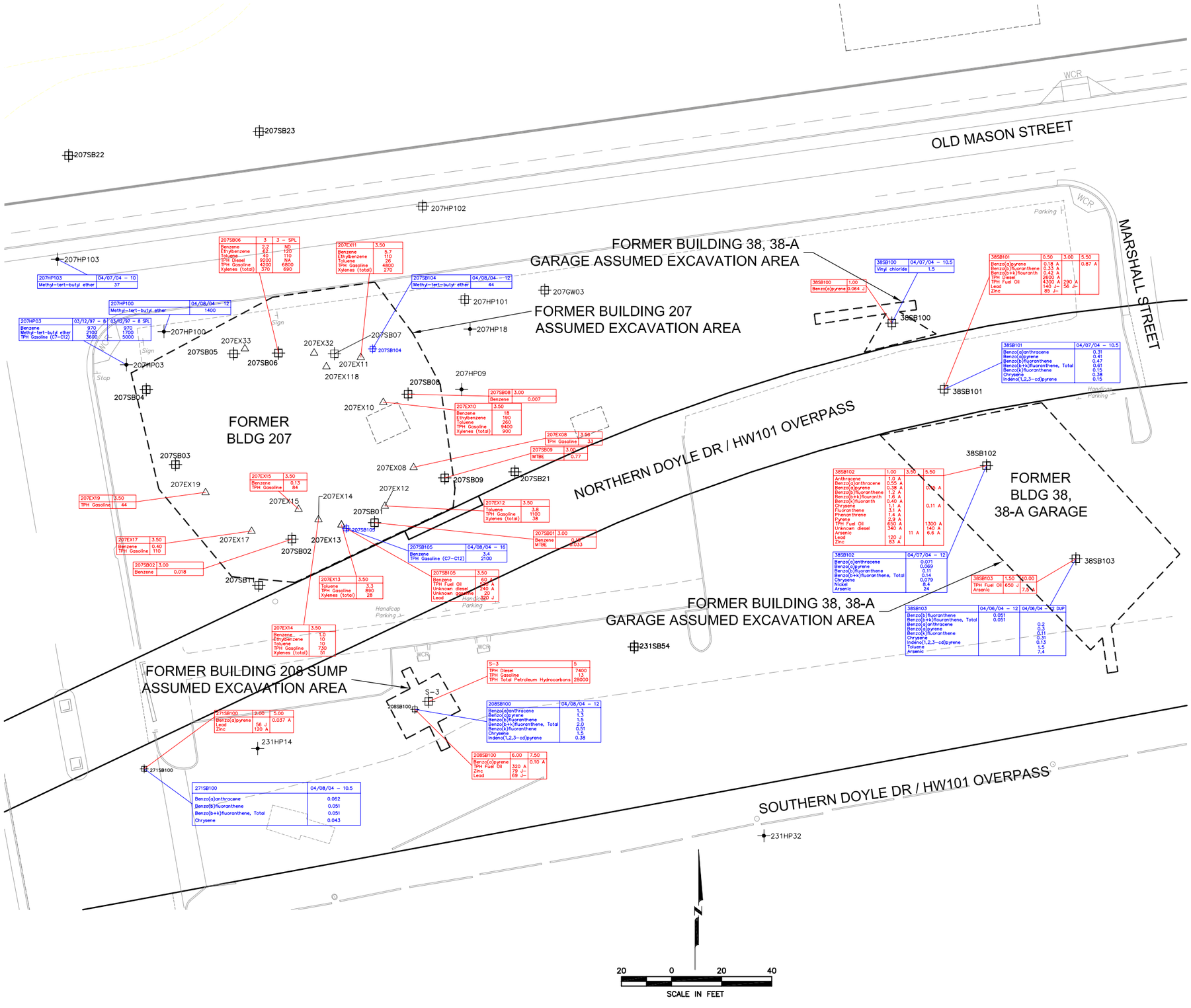
SHEET TITLE

## TEMPORARY CONTROLS PLAN

## C-103

SHEET 5 OF 33

4084075106004.DWG 96.0
20070919.1421




| 207SB06 | 3 | 3 – SPL |
|---|---|---|
| Benzene | 2.2 | ND |
| Ethylbenzene | 62 | 120 |
| Toluene | 40 | 110 |
| TPH Diesel | 9200 | NA |
| TPH Gasoline | 4200 | 6800 |
| Xylenes (total) | 370 | 690 |

| 207EX11 | 3.50 |
|---|---|
| Benzene | 5.7 |
| Ethylbenzene | 110 |
| Toluene | 26 |
| TPH Gasoline | 4800 |
| Xylenes (total) | 270 |

| 207HP103 | 04/07/04 – 10 |
|---|---|
| Methyl-tert-butyl ether | 37 |

| 207HP100 | 04/08/04 – 12 |
|---|---|
| Methyl-tert-butyl ether | 1400 |

| 207HP03 | 03/12/97 – 8 | 03/12/97 – 8 SPL |
|---|---|---|
| Benzene | 970 | 970 |
| Methyl-tert-butyl ether | 2100 | 1700 |
| TPH Gasoline (C7–C12) | 3600 | 5000 |

| 207SB104 | 04/08/04 – 12 |
|---|---|
| Methyl-tert-butyl ether | 44 |

| 207EX10 | 3.50 |
|---|---|
| Benzene | 18 |
| Ethylbenzene | 190 |
| Toluene | 260 |
| TPH Gasoline | 9400 |
| Xylenes (total) | 900 |

| 207SB08 | 3.00 |
|---|---|
| Benzene | 0.007 |

| 207EX08 | 3.50 |
|---|---|
| TPH Gasoline | 33 |

| 207SB09 | 3.00 |
|---|---|
| MTBE | 0.77 |

| 207EX15 | 3.50 |
|---|---|
| Benzene | 0.13 |
| TPH Gasoline | 84 |

| 207EX19 | 3.50 |
|---|---|
| TPH Gasoline | 44 |

| 207EX12 | 3.50 |
|---|---|
| Toluene | 3.8 |
| TPH Gasoline | 1100 |
| Xylenes (total) | 38 |

| 207EX17 | 3.50 |
|---|---|
| Benzene | 0.40 |
| TPH Gasoline | 110 |

| 207SB02 | 3.00 |
|---|---|
| Benzene | 0.018 |

| 207SB01 | 3.00 |
|---|---|
| Benzene | 0.50 |
| MTBE | 0.033 |

| 207EX13 | 3.50 |
|---|---|
| Toluene | 3.3 |
| TPH Gasoline | 890 |
| Xylenes (total) | 28 |

| 207SB105 | 04/08/04 – 16 |
|---|---|
| Benzene | 3.4 |
| TPH Gasoline (C7–C12) | 2100 |

| 207SB105 | 3.50 | |
|---|---|---|
| Benzene | 60 | |
| TPH Fuel Oil | 240 | A |
| Unknown diesel | 240 | A |
| Unknown Gasoline | 320 | J |
| Lead | 83 | A |

| 207EX14 | 3.50 |
|---|---|
| Benzene | 1.0 |
| Ethylbenzene | 10 |
| Toluene | 10 |
| TPH Gasoline | 730 |
| Xylenes (total) | 51 |

| 385B100 | 04/07/04 – 10.5 |
|---|---|
| Vinyl chloride | 1.5 |

| 385B100 | 1.00 |
|---|---|
| Benzo(a)pyrene | 0.064 J |

| 385B101 | 0.50 | 3.00 | 5.50 |
|---|---|---|---|
| Benzo(a)pyrene | 0.18 | A | 0.87 A |
| Benzo(b)fluoranthene | 0.42 | A | |
| Benzo(b+k)fluoranth | 9600 | A | |
| TPH Fuel Oil | 4300 | A | 290 A |
| Lead | 140 | J– | 56 J– |
| Zinc | 85 | J– | |

| 385B101 | 04/07/04 – 10.5 |
|---|---|
| Benzo(a)anthracene | 0.31 |
| Benzo(a)pyrene | 0.41 |
| Benzo(b)fluoranthene | 0.47 |
| Benzo(b+k)fluoranthene, Total | 0.61 |
| Benzo(k)fluoranthene | 0.15 |
| Chrysene | 0.38 |
| Indeno(1,2,3–cd)pyrene | 0.15 |

| 38SB102 | 1.00 | 3.50 | 5.50 |
|---|---|---|---|
| Anthracene | 1.0 | A | |
| Benzo(a)anthracene | 0.55 | A | |
| Benzo(a)pyrene | 0.38 | A | 0.16 A |
| Benzo(b)fluoranthene | 1.2 | A | |
| Benzo(b+k)fluoranth | 1.6 | A | |
| Benzo(k)fluoranth | 0.40 | A | |
| Chrysene | 1.1 | A | 0.11 A |
| Fluoranthene | 3.1 | A | |
| Phenanthrene | 1.4 | A | |
| Pyrene | 2.9 | A | |
| TPH Fuel Oil | 650 | A | 1300 A |
| Unknown diesel | 340 | A | 140 A |
| Arsenic | | 11 A | 6.6 A |
| Lead | 120 | J | |
| Zinc | 83 | A | |

| 38SB102 | 04/07/04 – 12 |
|---|---|
| Benzo(a)anthracene | 0.071 |
| Benzo(a)pyrene | 0.069 |
| Benzo(b)fluoranthene | 0.11 |
| Benzo(b+k)fluoranthene, Total | 0.14 |
| Chrysene | 0.079 |
| Nickel | 8.4 |
| Arsenic | 24 |

| 38SB103 | 1.50 | 10.00 |
|---|---|---|
| TPH Fuel Oil | 650 J | |
| Arsenic | | 7.5 A |

| 38SB103 | 04/06/04 – 12 | 04/06/04 – 12 DUP |
|---|---|---|
| Benzo(b)fluoranthene | 0.051 | 0.2 |
| Benzo(b+k)fluoranthene, Total | 0.051 | 0.3 |
| Benzo(a)anthracene | | 0.11 |
| Benzo(a)pyrene | | 0.11 |
| Benzo(k)fluoranthene | | 0.31 |
| Chrysene | | 0.13 |
| Indeno(1,2,3–cd)pyrene | | 1.5 |
| Toluene | | 7.4 |
| Arsenic | | |

| 208SB100 | 04/08/04 – 12 |
|---|---|
| Benzo(a)anthracene | 1.3 |
| Benzo(a)pyrene | 1.3 |
| Benzo(b)fluoranthene | 1.5 |
| Benzo(b+k)fluoranthene, Total | 2.0 |
| Benzo(k)fluoranthene | 0.51 |
| Chrysene | 1.5 |
| Indeno(1,2,3–cd)pyrene | 0.38 |

| S–3 | 5 |
|---|---|
| TPH Diesel | 7400 |
| TPH Gasoline | 13 |
| TPH Total Petroleum Hydrocarbons | 28000 |

| 208SB100 | 6.00 | 7.50 |
|---|---|---|
| Benzo(a)pyrene | | 0.10 A |
| TPH Fuel Oil | 320 A | |
| Zinc | 79 J– | |
| Lead | 69 J– | |

| 271SB100 | 2.00 | 5.00 |
|---|---|---|
| Benzo(a)pyrene | | 0.037 A |
| Lead | 56 J | |
| Zinc | 120 A | |

| 271SB100 | 04/08/04 – 10.5 |
|---|---|
| Benzo(a)anthracene | 0.062 |
| Benzo(b)fluoranthene | 0.051 |
| Benzo(b+k)fluoranthene, Total | 0.051 |
| Chrysene | 0.043 |

| Chemical | Final Soil Cleanup Levels (mg/kg) | Groundwater Cleanup Levels (µg/L) |
|---|---|---|
| **Total Petroleum Hydrocarbons (TPH)** | | |
| TPH as gasoline | 11.6 | 443 |
| TPH as diesel | 115 | 443 |
| TPH as fuel oil | 144 | 443 |
| TPH Unknown Diesel Hydrocarbon | – | 443 |
| TPH Unknown Gasoline Hydrocarbon | – | 443 |
| **Polynuclear Aromatic Compounds (PAHs)** | | |
| Acenaphthene | 0.31 | 1200 |
| Acenaphthylene | 0.067 | -- |
| Anthracene | 0.45 | 770 |
| Benzo(a)anthracene | 0.27 | 0.0044 |
| Benzo(a)pyrene (B(a)P) | 0.027 | 0.0044 |
| Benzo(b)fluoranthene | 0.27 | 0.0044 |
| Benzo(b+k)fluoranthene, Total | 0.27 | 0.0044 |
| Benzo(g,h,i)perylene | 0.25 | 150 |
| Benzo(k)fluoranthene | 0.27 | 0.0044 |
| Chrysene | 0.67 | 0.0044 |
| Dibenzo(a,h)anthracene | 0.071 | 300 |
| Fluoranthene | 1.5 | 300 |
| Fluorene | 0.28 | 300 |
| Indeno(1,2,3-cd)pyrene | 0.26 | 0.0044 |
| Naphthalene | 0.3 | 300 |
| Phenanthrene | 0.61 | 230 |
| Pyrene | 0.79 | 230 |
| Total PAHs | 5.6 | 0.031 |
| **Metals / Inorganics** | | |
| Aluminum | 76000 | 1,000 |
| Arsenic | 6.2 | 10 |
| Barium | 320 | 1,000 |
| Beryllium | 10 | -- |
| Cadmium | 0.8 | 1.1 |
| Calcium | -- | -- |
| Chloride | -- | 250,000 |
| Chromium | 140 | 50 |
| Cobalt | 21 | 3 |
| Copper | 49 | 3.1 |
| Cyanide | 1000 | -- |
| Iron | 23000 | -- |
| Lead | 50 | 2.5 |
| Magnesium | -- | -- |
| Manganese | 1800 | -- |
| Mercury | 0.4 | -- |
| Nickel | 110 | 8.2 |
| Nitrate | -- | 10,000 |
| Potassium | -- | -- |
| Silver | 1 | -- |
| Sodium | -- | -- |
| Vanadium | 90 | 15 |
| Zinc | 60 | 81 |
| **Volatile Organic Compounds (VOCs)** | | |
| 1,1,1-Trichloroethane | -- | 200 |
| 1,1,2,2-Tetrachloroethane | -- | 1 |
| 1,1,2-Trichloroethane | -- | 5 |
| 1,1,-Dichloroethane | -- | 5 |
| 1,2,4-Trimethylbenzene | 52 | -- |
| 1,2-Dichlorobenzene | 1.1 | 14 |
| 1,2-Dichloroethane | -- | 0.38 |
| 1,2-Dichloroethene (cis & trans) | -- | 6 |
| 1,2-Dichloropropane | -- | 5 |
| 1,3,5-Trimethylbenzene | 21 | -- |
| 1,3-Dichlorobenzene | -- | 65 |
| 1,4-Dichlorobenzene | 0.13 | 5 |
| 2-Butanone | 3.8 | 4,200 |
| 2-Hexanone | 2.8 | 700 |
| Acetone | 0.24 | 1,500 |
| Benzene | 0.005 | 1 |
| Bromoform | -- | 100 |
| Carbon dioxide | -- | -- |
| Carbon disulfide | 200 | -- |
| Chlorobenzene | -- | 70 |
| Chloroform | -- | 80 |
| Chloromethane | -- | 1.3 |
| cis-1,2-Dichloroethene | 0.19 | 6 |
| Ethane | -- | -- |
| Ethene | -- | -- |
| Ethylbenzene | 5 | 43 |
| Methane | -- | -- |
| Methyl t-butyl ether | 0.023 | 13 |
| Methylene chloride | 0.076 | 4.7 |
| sec-Butylbenzene | -- | -- |
| Styrene | -- | 100 |
| tert-Butylbenzene | -- | -- |
| Tetrachloroethene | 0.087 | 0.8 |
| Toluene | 1 | 150 |
| Trichloroethene | 0.26 | 2.7 |
| Trichlorofluoromethane | -- | 150 |
| Vinyl chloride | -- | 0.5 |
| Xylenes | 5.7 | 130 |
| Xylenes (m&p-) | 5.7 | 130 |
| Xylenes (o-) | 5.7 | 130 |
| **Semi-Volatile Organic Compounds (SVOCs)** | | |
| Bis(2-ethylhexyl)phthalate | 66 | -- |
| **Pesticides and PCBs** | | |
| 4,4-DDD | 0.011 | -- |
| Arochlor 1016 | 0.033 | 0.00017 |
| **Polychlorinated Biphenyls (PCBs)** | | |
| PCB 1016 | – | 0.00017 |

NOTES:

1. PREVIOUS SOIL ANALYSIS INFORMATION OBTAINED FROM CORRECTIVE ACTION PLAN (MACTEC, 2007). DATA PRESENTED ON THIS DRAWING IS LIMITED TO ANALYTES THAT EXCEED CLEANUP LEVELS.
2. ALL LOCATIONS ARE APPROXIMATE.
3. THE MOST CONSERVATIVE CLEANUP LEVELS ARE USED IN THE POSTING ON THIS FIGURE.

GROUNDWATER CONCENTRATIONS EXCEEDING CLEANUP LEVELS:

| 38SB100 | 04/07/04 – 10.5 |
|---|---|
| Vinyl chloride | 1.5 |

STATION NAME
DATE AND DEPTH OF SAMPLE
CONCENTRATION µg/L
ANALYTE

SOIL CONCENTRATIONS EXCEEDING CLEANUP LEVELS:

| 38SB100 | 1.00 |
|---|---|
| Benzo(a)pyrene | 0.64 J |

STATION NAME
DEPTH OF SAMPLE
CONCENTRATION mg/kg
ANALYTE

- SPL = Split - DUP = DUPLICATE

NOTE: ONLY RESULTS THAT WERE DETECTED ABOVE CLEANUP LEVELS ARE SHOWN.
DETECTION LIMITS FOR VARIOUS PESTICIDES EXCEEDED CLEANUP LEVELS.

DRAWING REDUCED
REFER TO GRAPHIC SCALE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REGISTERED PROFESSIONAL ENGINEER RAMIN T. SHOME No. C 061467 EXP. 06/30/09 CIVIL STATE OF CALIFORNIA

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PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106005.dwg
DRAWN/DESIGN BY: J.HANZEL-DURBIN
CHECKED BY: R .RAO



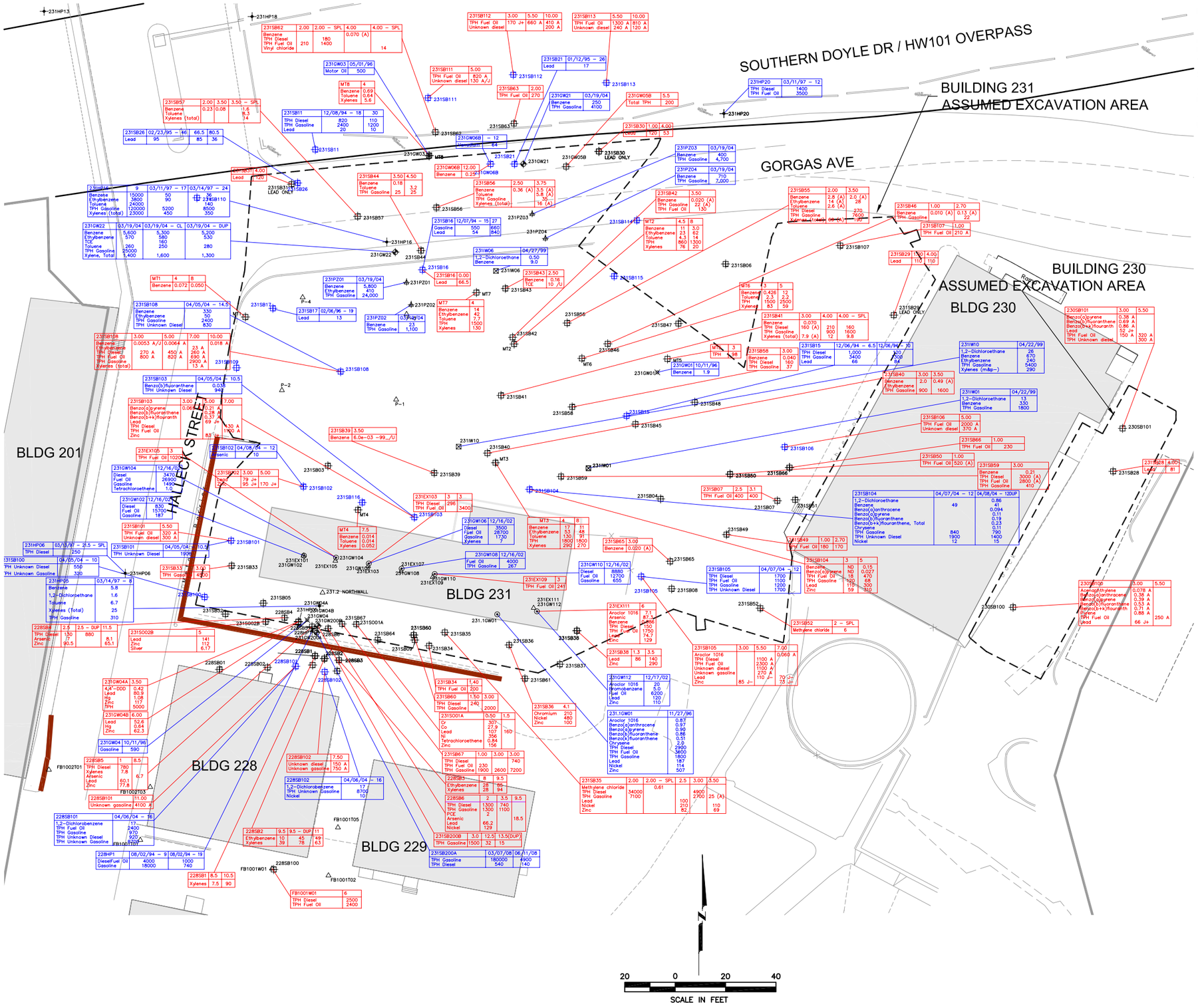
SHEET TITLE

## PREVIOUS SOIL AND GROUNDWATER ANALYSIS RESULTS NORTH AREA

## C-104

SHEET 6 OF 33

4084075106005.DWG 96.0
20080715.1437




NOTES:

1. PREVIOUS SOIL ANALYSIS INFORMATION OBTAINED FROM CORRECTIVE ACTION PLAN (MACTEC, 2007). DATA PRESENTED ON THIS DRAWING IS LIMITED TO ANALYTES THAT EXCEED CLEANUP LEVELS.
2. ALL LOCATIONS ARE APPROXIMATE.
3. REFER TO DRAWING C-103 FOR EXPLANATION OF DATA PROVIDED ON THIS DRAWING.
4. THE MOST CONSERVATIVE CLEANUP LEVELS ARE USED IN THE POSTING ON THIS FIGURE.

DRAWING REDUCED
REFER TO GRAPHIC SCALE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REGISTERED PROFESSIONAL ENGINEER
ANN S. HONG
No. 61467
EXP. 06/30/09
CIVIL
STATE OF CALIFORNIA

# BUILDING 207/231 REMEDIATION

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PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106005.dwg
DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R .RAO



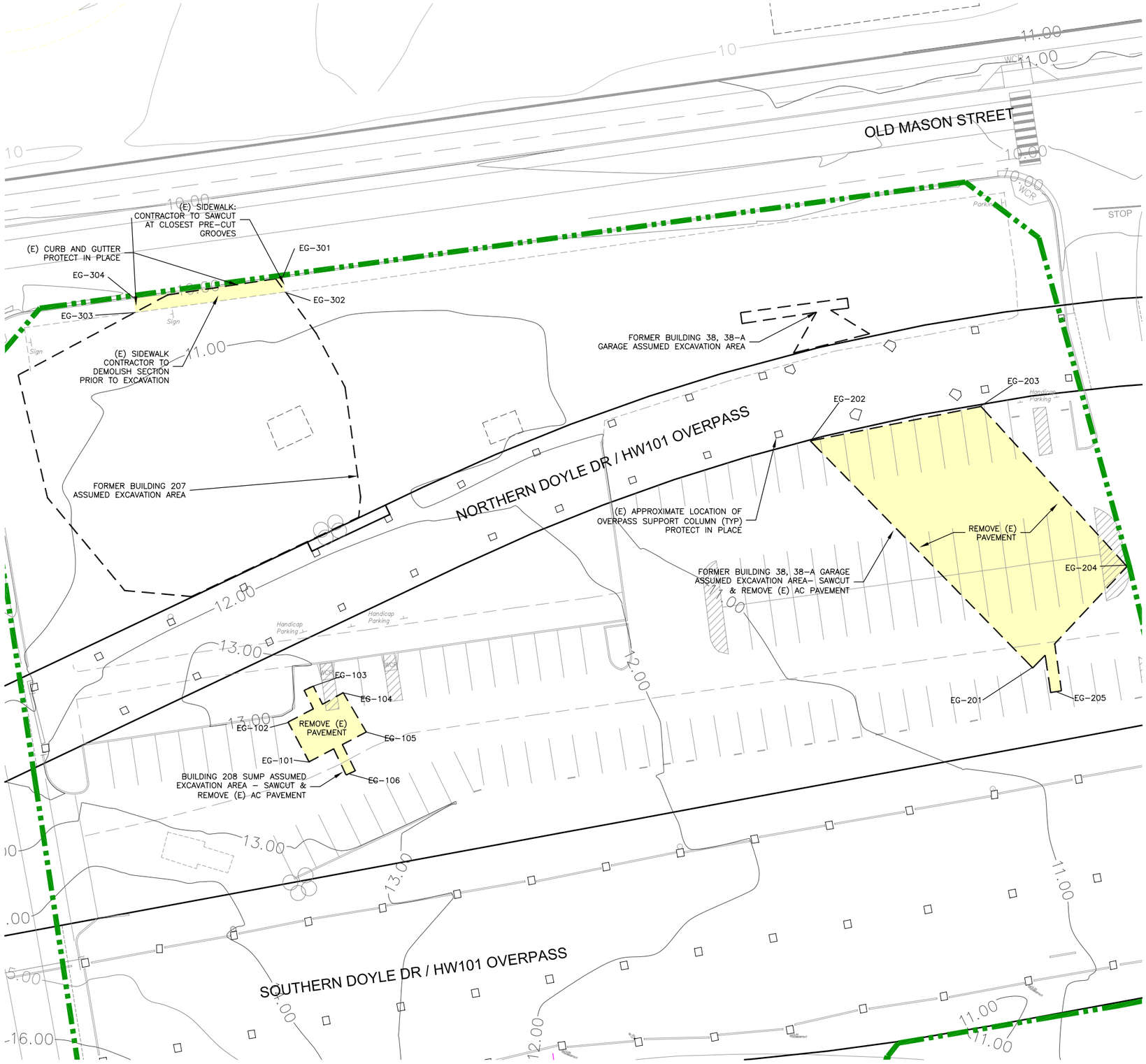
SHEET TITLE

## PREVIOUS SOIL AND GROUNDWATER ANALYSIS RESULTS SOUTH AREA

## C-105

SHEET 7 OF 33

4084075106005.DWG 96.0




NOTES:

1. CONTRACTOR TO SAWCUT & REMOVE PAVEMENT AND SIDEWALK AS SHOWN BY SHADING.

2. CONTRACTOR TO MAINTAIN A MINIMUM OF 1 FOOT SEPARATION BETWEEN TOP OF EXCAVATION AND CALTRANS RIGHT OF WAY BOUNDARIES.

3. CONTRACTOR TO RECYCLE ALL DEMOLISHED MATERIALS IF POSSIBLE. ASSUME NO MATERIALS TO BE SAVED UNLESS NOTED.

4. CONTRACTOR SHALL COORDINATE WITH OWNER'S UTILITY DEPT. FOR UTILITY IDENTIFICATION A MINIMUM OF 2 WEEKS IN ADVANCE OF CONSTRUCTION.

DEMOLITION CONTROL POINTS

| POINT | NORTHING | EASTING |
|---|---|---|
| EG-101 | 480588.0 | 1435814.8 |
| EG-102 | 480602.9 | 1435806.3 |
| EG-103 | 480616.1 | 1435814.8 |
| EG-104 | 480614.3 | 1435827.5 |
| EG-105 | 480599.4 | 1435836.4 |
| EG-106 | 480583.5 | 1435830.3 |
| EG-201 | 480623.8 | 1436087.9 |
| EG-202 | 480709.4 | 1436004.3 |
| EG-203 | 480722.4 | 1436068.3 |
| EG-204 | 480662.4 | 1436123.5 |
| EG-205 | 480614.7 | 1436096.8 |
| EG-301 | 480771.1 | 1435804.9 |
| EG-302 | 480765.4 | 1435805.8 |
| EG-303 | 480757.8 | 1435749.3 |
| EG-304 | 480763.1 | 1435748.5 |

N

20 0 20 40
SCALE IN FEET

DRAWING REDUCED
REFER TO GRAPHIC SCALE

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ENGINEERING & CONSULTING, INC.
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REGISTERED PROFESSIONAL ENGINEER
RAMESH RAO
No. 51467
EXP: 06/30/09
CIVIL
STATE OF CALIFORNIA

# BUILDING 207/231 REMEDIATION

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| 1 | 11/2007 | REVISED DRAFT |

PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106006.dwg
DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R. RAO



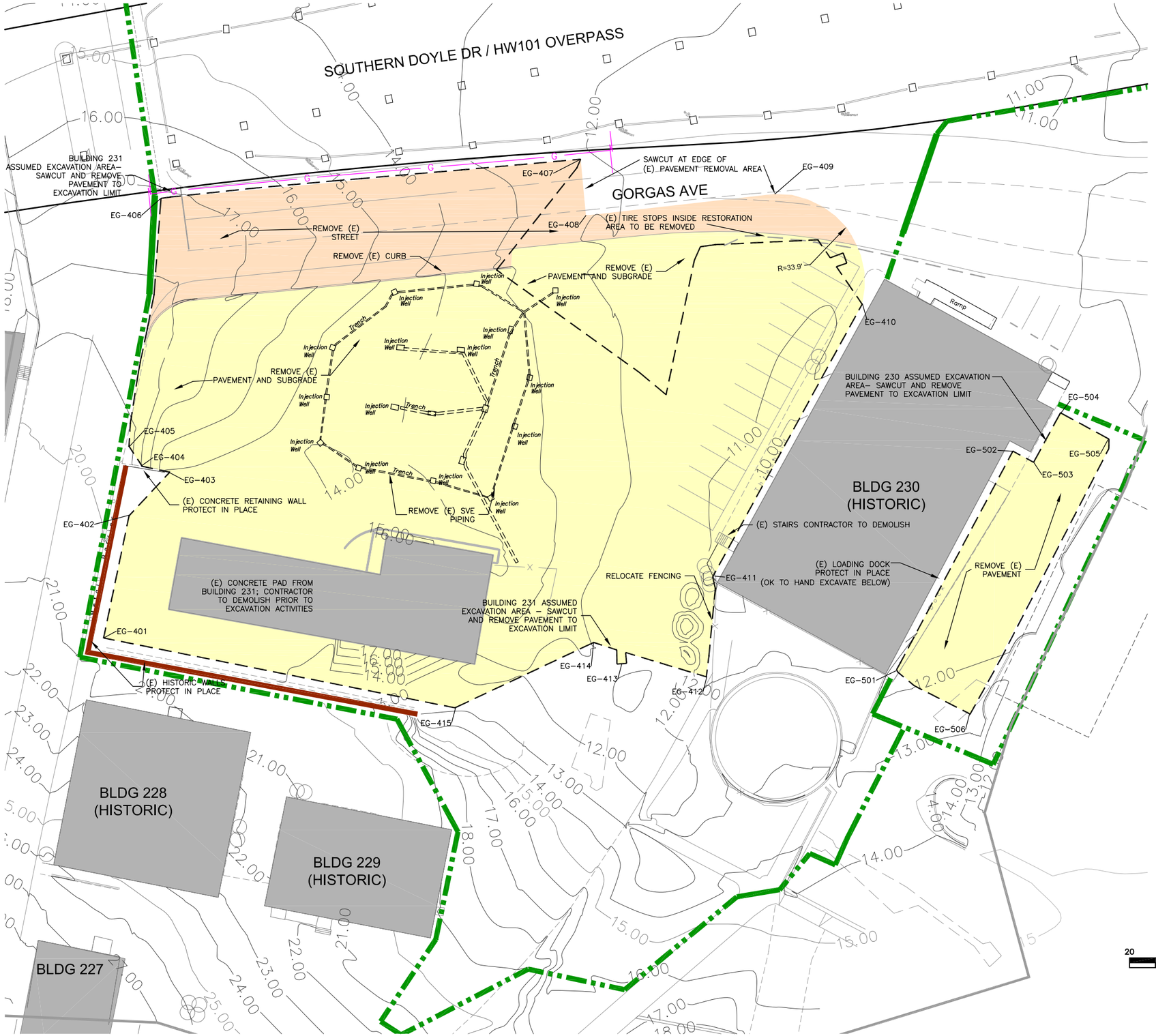
SHEET TITLE

## DEMOLITION PLAN NORTH AREA

## C-106

SHEET 8 OF 33

4084075106006.DWG 20.0
20081016.1021




NOTES:

1. A SEPARATE CONTRACTOR WILL BE PROCURED TO DEMOLISH BUILDING 231 AND ALL ASSOCIATED APPURTENANCES INCLUDING SVE SYSTEM LOCATED ON EAST SIDE OF BLDG.

2. CONTRACTOR TO SAWCUT & REMOVE AC AND AB OF STREET SECTIONS AND PAVEMENT (INCLUDING WHEEL STOPS) AS SHOWN BY ORANGE AND YELLOW SHADING RESPECTIVELY.

3. CONTRACTOR TO MAINTAIN A MINIMUM OF 3 FEET SEPARATION BETWEEN TOP OF EXCAVATION AND HISTORIC BUILDING 230, EXISTING NATURAL GAS LINE, AND 5 FEET SEPARATION BETWEEN TOP OF EXCAVATION AND HISTORIC WALL.

4. CONTRACTOR TO RECYCLE ALL DEMOLISHED MATERIALS IF POSSIBLE. ASSUME NO MATERIALS TO BE SAVED UNLESS NOTED.

5. CONTRACTOR SHALL COORDINATE WITH OWNER'S UTILITY DEPT. FOR UTILITY IDENTIFICATION A MINIMUM OF 2 WEEKS IN ADVANCE OF CONSTRUCTION.

6. CONTRACTOR TO MAINTAIN 3 FEET SEPARATION FROM EXISTING NATURAL GAS LINE AND NORTH FACE OF BUILDING 231 RU EXCAVATION.

DEMOLITION CONTROL POINTS

| POINT | NORTHING | EASTING |
|---|---|---|
| EG–401 | 480282.1 | 1435711.1 |
| EG–402 | 480329.6 | 1435721.2 |
| EG–403 | 480346.0 | 1435736.4 |
| EG–404 | 480348.7 | 1435725.7 |
| EG–405 | 480356.1 | 1435720.9 |
| EG–406 | 480453.5 | 1435733.2 |
| EG–407 | 480468.7 | 1435893.5 |
| EG–408 | 480445.5 | 1435897.6 |
| EG–409 | 480453.8 | 1435970.8 |
| EG–410 | 480411.3 | 1436004.6 |
| EG–411 | 480305.9 | 1435947.4 |
| EG–412 | 480266.9 | 1435944.4 |
| EG–413 | 480271.9 | 1435911.4 |
| EG–414 | 480280.2 | 1435900.6 |
| EG–415 | 480254.8 | 1435847.1 |
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| EG–503 | 480349.9 | 1436070.8 |
| EG–504 | 480369.2 | 1436081.6 |
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| EG–506 | 480252.4 | 1436046.0 |

DRAWING REDUCED
REFER TO GRAPHIC SCALE

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REGISTERED PROFESSIONAL ENGINEER RAMESH RAO 051467 EXP: 06/30/09 CIVIL STATE OF CALIFORNIA

# BUILDING 207/231 REMEDIATION

OWNER
PRESIDIO TRUST
34 GRAHAM STREET
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SAN FRANCISCO, CALIFORNIA
(415) 561 - 5300

THE PRESIDIO TRUST

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| 1 | 11/2007 | REVISED DRAFT |

PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106006.dwg
DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R.RAO



SHEET TITLE

## DEMOLITION PLAN SOUTH AREA

## C-107

SHEET 9 OF 33

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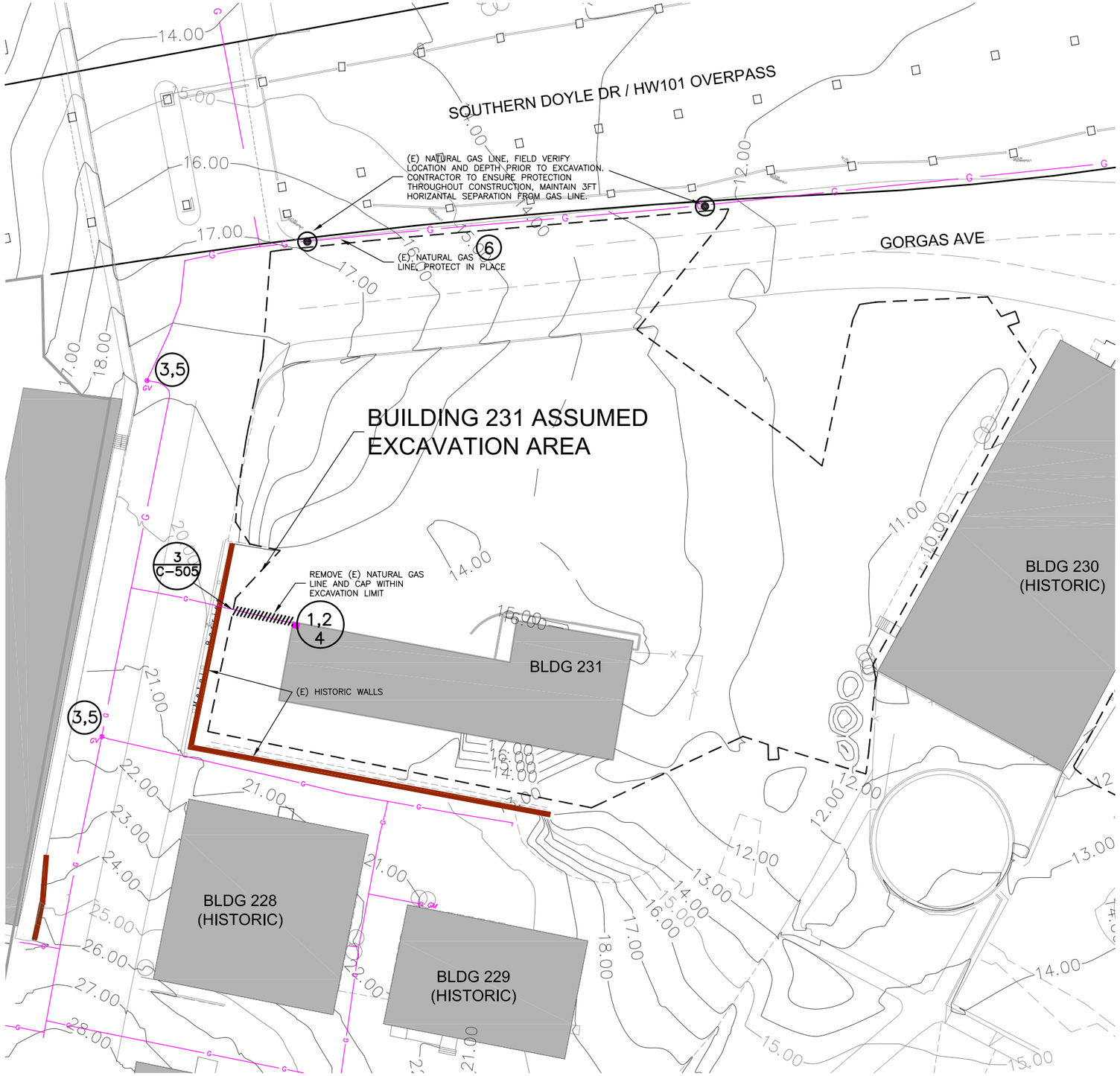


NATURAL GAS LINE IN BUILDING 231 EXCAVATION:

1. CONTRACTOR SHALL COORDINATE WITH OWNER UTILITY DEPT. AND PG&E FOR UTILITY IDENTIFICATION A MINIMUM OF 2 WEEKS IN ADVANCE OF CONSTRUCTION.

2. NOTIFY ALL BUILDINGS THAT MAY BE AFFECTED BY WORK AND TEMPORARY DISCONNECTION OF GAS SERVICE A MINIMUM OF 1 WEEK PRIOR TO WORK DIRECTLY AFFECTING THE BUILDINGS.

3. CONTRACTOR TO SHUT OFF GAS VALVES FEEDING LINES TO FORMER BUILDING 231.

4. CONTRACTOR TO REMOVE GAS LINE UP TO THE FACE OF THE EXCAVATION (SOUTH WEST CORNER) AND INSTALL CAP AT THE EXCAVATION FACE.

5. CONTRACTOR TO OPEN GAS VALVE PREVIOUSLY CLOSED TO RE-ESTABLISH GAS AT OTHER BUILDINGS THAT MAY HAVE LOST GAS SERVICE.

6. DURING EXCAVATION CONTRACTOR TO USE BEST MANAGEMENT PRACTICES TO PROTECT GAS LINE IN PLACE DURING EXCAVATION.

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**BUILDING 207/231 REMEDIATION**

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| PROJECT NO: | 4084075106 07 |
| CAD DWG FILE: | 4084075106045.dwg |
| DRAWN/DESIGN BY: | J. HANZEL-DURBIN |
| CHECKED BY: | R .RAO |



SHEET TITLE

**GAS UTILITY PLAN SOUTH AREA**

**C-108**

SHEET 10 OF 33

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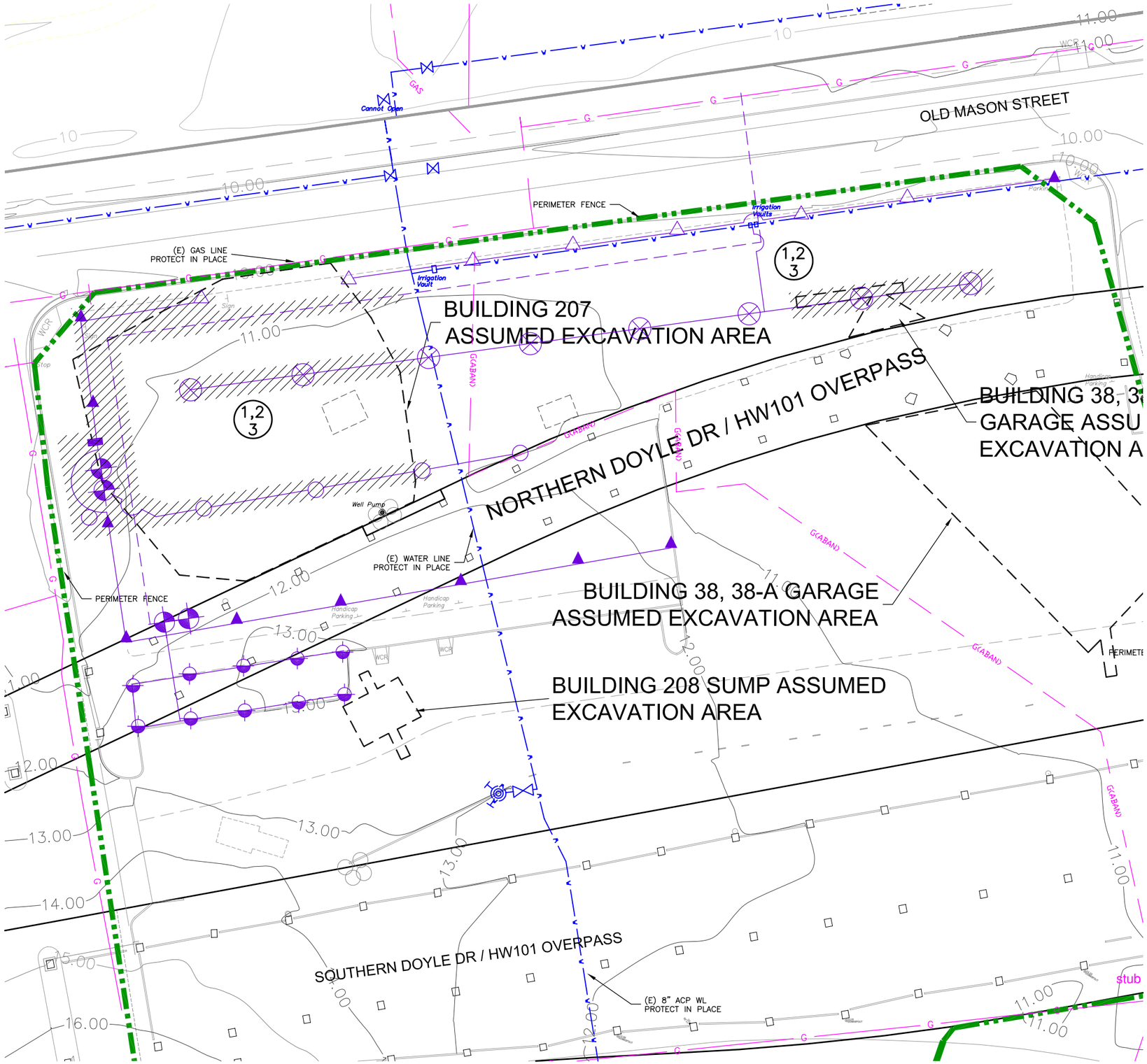


NOTES:

IRRIGATION SYSTEM REMOVAL:

1. CONTRACTOR SHALL COORDINATE WITH OWNER'S UTILITY DEPT. FOR UTILITY IDENTIFICATION A MINIMUM OF 2 WEEKS IN ADVANCE OF CONSTRUCTION.

2. CONTRACTOR TO COORDINATE THE SHUT OFF ALL AUTOMATED IRRIGATION SYSTEMS IN THE BUILDING 207 AREA FROM IRRIGATION BOXES ALONG MASON STREET.

3. CONTRACTOR TO REMOVE AND CAP ALL IRRIGATION PIPING LOCATED INSIDE OF THE FORMER BUILDING 207 EXCAVATION AND THE NORTHERN BUILDING 38, 38-A GARAGE EXCAVATION. SYSTEM LOCATION ON MAP IS APPROXIMATE AND WILL NEED TO BE FIELD VERIFIED PRIOR TO EXCAVATION.

4. CONTRACTOR TO COORDINATE WITH TRUST UTILITY DEPARTMENT AND OBTAIN SPECIFICATION FOR PRODUCT TO BE USED PRIOR TO EXCAVATION. TYPICAL PRODUCT SPECIFICATIONS ARE PROVIDED IN THE LEGEND.

**LEGEND:**

- I-20-ARS HUNTER POP-UP ROTARY SPRINKLER (LAWN)
- I-25-ARS HUNTER POP-UP ROTARY SPRINKLER (LAWN)
- I-40-ARS HUNTER POP-UP ROTARY SPRINKLER (LAWN)
- I-25-3RS HUNTER POP-UP ROTARY SPRINKLER (LAWN)
- I-40-3RS HUNTER POP-UP ROTARY SPRINKLER (LAWN)
- 2000 SERIES GRISWOLD REMOTE CONTROL VALVE

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REFER TO GRAPHIC SCALE

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# BUILDING 207/231 REMEDIATION

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PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106064.DWG
DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R .RAO



SHEET TITLE

**WATER AND GAS UTILITY PLAN NORTH AREA**

**C-109**
SHEET 11 OF 33

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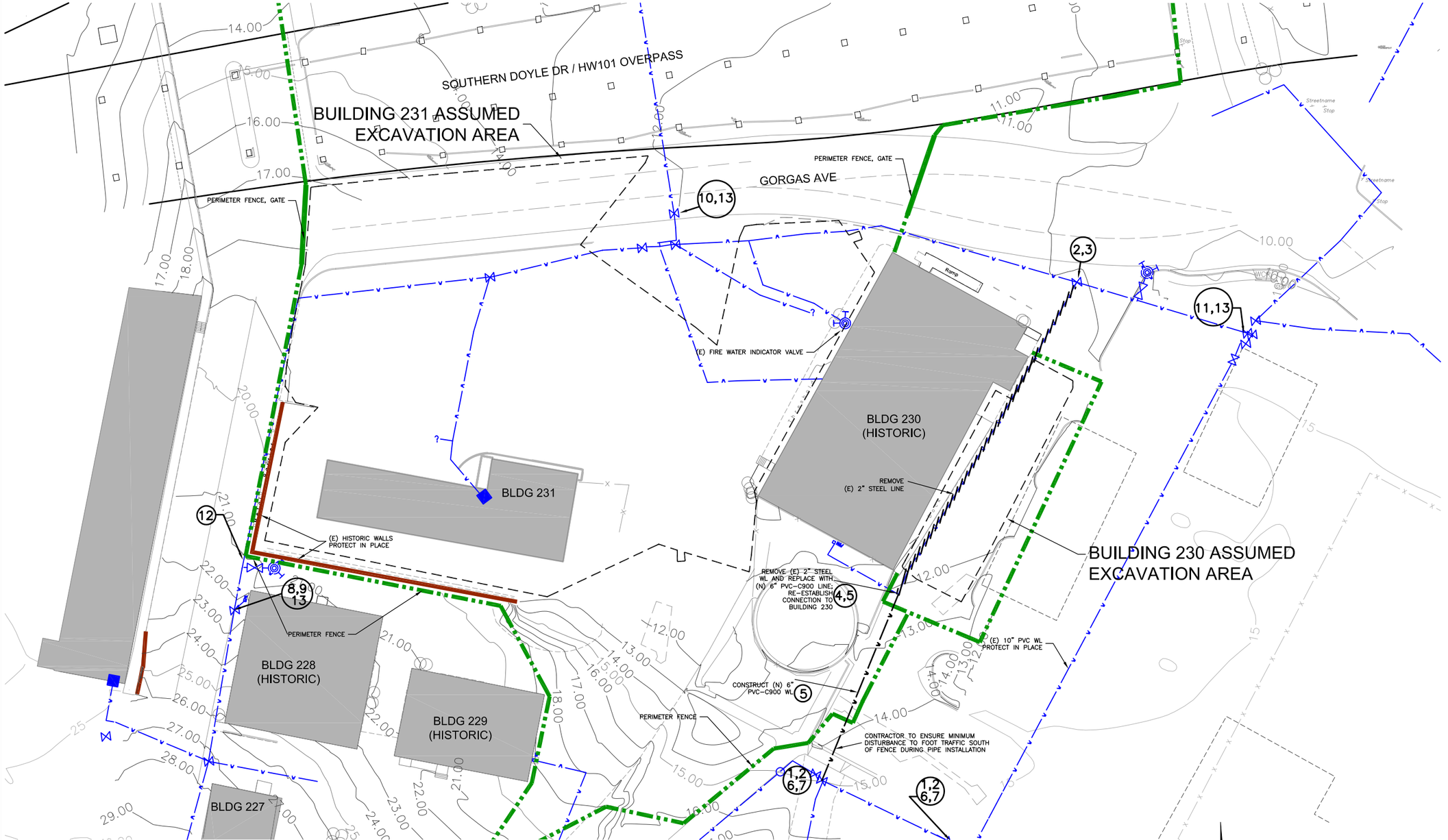


UTILITY NOTES:

PRE-EXCAVATION ACTIVITIES AT BUILDING 207/230 AREAS:

1. CONTRACTOR SHALL COORDINATE WITH OWNER UTILITY DEPT. FOR UTILITY IDENTIFICATION A MINIMUM OF 2 WEEKS IN ADVANCE OF CONSTRUCTION.

2. CONTRACTOR TO NOTIFY BUILDING 230 TENANTS OF WORK AND TEMPORARY DISCONNECTION OF WATER SERVICE A MINIMUM OF 1 WEEK PRIOR TO WORK DIRECTLY AFFECTING THE BUILDING.

3. CONTRACTOR TO SHUT OFF WATER VALVE NORTH EAST OF BUILDING 230.

4. CONTRACTOR TO REMOVE EXISTING 2" WATER LINE EAST OF BUILDING 230 UP TO AND INCLUDING THE BUILDING JUNCTION AS SHOWN ABOVE.

5. CONTRACTOR TO CONSTRUCT NEW 6" PVC-C900 WATER LINE FROM THE VALVE SOUTH OF BUILDING 230 TO THE JUNCTION AT THE SOUTH EAST CORNER OF THE BUILDING. CONNECTION WILL BE MADE USING A STANDARD PVC-C900 TEE. TEMPORARILY PLUG THE NORTH FACING OPENING TO ALLOW FOR A NEW CONNECTION FOLLOWING THE EXCAVATION.

6. CONTRACTOR TO NOTIFY BUILDING 1029 TENNANTS OF TEMPORARY DISCONECTION OF WATER SERVICE. CONTRACTOR TO SHUT OFF TWO WATER VALVES SOUTH OF BUILDING 230. CONNECT NEW LINE TO EXISTING LINE SOUTH EAST OF BUILDING 230 USING PVC-C900 TEE.

7. OPEN VALVES SOUTH OF BUILDING 230 TO RESTORE WATER SERVICE.

8. CONTRACTOR TO NOTIFY BUILDING 228 AND 230 TENANTS OF WORK AND TEMPORARY DISCONNECTION OF WATER SERVICE A MINIMUM OF 1 WEEK PRIOR TO WORK DIRECTLY AFFECTING THE BUILDING.

9. CONTRACTOR TO SHUT OFF WATER VALVE ON HALLECK STREET TO THE WEST OF BUILDING 228.

10. CONTRACTOR TO SHUT OFF WATER VALVE ON GORGAS AVE.

11. CONTRACTOR TO SHUT OFF WATER VALVE NORTH EAST OF BUILDING 230.

12. POTHOLE TO CUT AND CAP THE WATER LINE NORTH OF THE FIRE HYDRANT CONNECTION TO THE LINE.

13. CONTRACTOR TO OPEN 3 PREVIOUSLY SHUT OFF VALVES AND RESTORE SERVICE TO BUILDING 228 AND 230.

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051467
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# BUILDING 207/231 REMEDIATION

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PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106046.DWG
DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R .RAO



SHEET TITLE

## PRE-CONSTRUCTION WATER UTILITY PLAN SOUTH AREA

**C-110**

SHEET 12 OF 33

4084075106046.DWG 20.0
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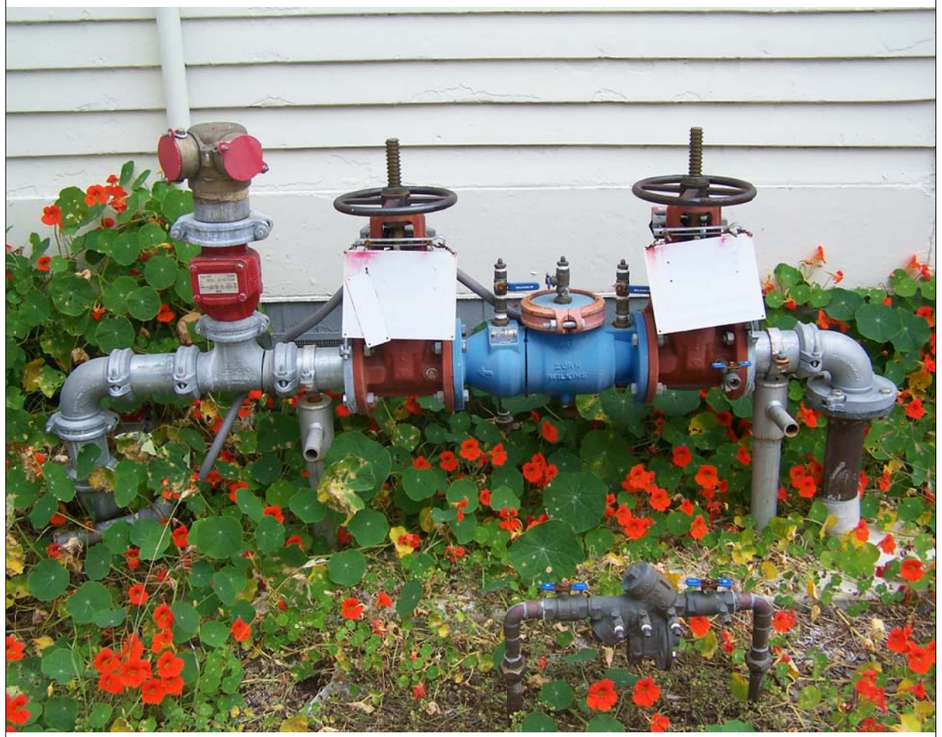
# DETAIL A



UTILITY NOTES:

230 EXCAVATION ACTIVITIES:

1. ACTIVITIES BELOW ARE TO BE PERFORMED AFTER FINAL CONFIRMATION SAMPLES HAVE CONFIRMED THE BLDG 230 RU AS CLEAN.

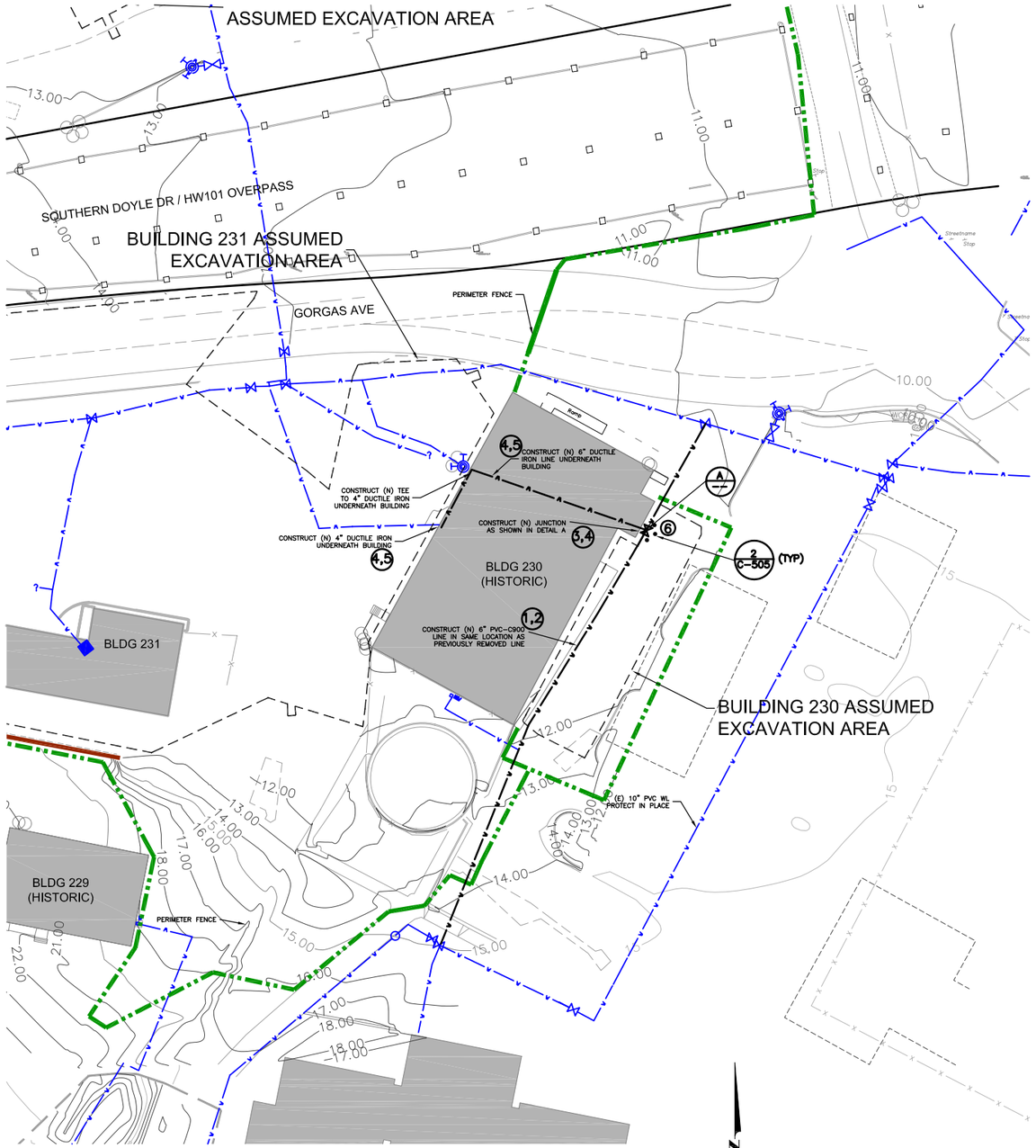
2. CONTRACTOR TO CONSTRUCT NEW 6" PVC–C900 WATER LINE FROM THE VALVE NORTH EAST OF BUILDING 230 TO THE TEMPORARILY PLUGGED TEE SOUTH EAST OF BUILDING 230, DO NOT MAKE CONNECTION AT TEE; RUN LINE ALONG THE SAME PATH OF PREVIOUSLY REMOVED WATER LINE TO THE EAST OF THE BUILDING.

3. DURING THE LINE REPLACEMENT A JUNCTION DEVICE (SEE DETAIL A) SHALL BE INSTALLED IN THE LINE CONTAINING A DUAL ON/OFF VALVE, FDC, AND CHECK VALVE.

4. THIS JUNCTION WILL ESTABLISH A NEW FIRE WATER CONNECTION TO THE BUILDING AND ASSURE POTABLE WATER USAGE IN ALL AREAS OF THE BUILDING THAT ARE CONNECTED TO THE INCOMING WATER LINE ON THE WEST SIDE OF THE BUILDING. FINAL SERVICE CONNECTION TO TAKE PLACE PRIOR TO BUILDING 231 RU EXCAVATION – UNTIL THEN CONTINUE SERVICE FROM WEST SIDE OF BUILDING.

5. CONTRACTOR WILL RUN A NEW 6" DUCTILE IRON PIPE UNDER THE BUILDING TO THE LOCATION OF THE CURRENT FIRE WATER CONNECTION. THE CONTRACTOR WILL ALSO INSTALL A TEE IN THIS LINE ON THE WEST SIDE OF THE BUILDING AND RUN A 4" DUCTILE TO THE LOCATION WHERE POTABLE WATER ENTERS THE BUILDING ON THE WEST SIDE.

6. CONTRACTOR TO PLACE BOLLARDS AROUND THE NEW DUAL ON/OFF VALVE, FDC, AND CHECK VALVE.

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REFER TO GRAPHIC SCALE

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**BUILDING 207/231 REMEDIATION**

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PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106047.DWG
DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R .RAO



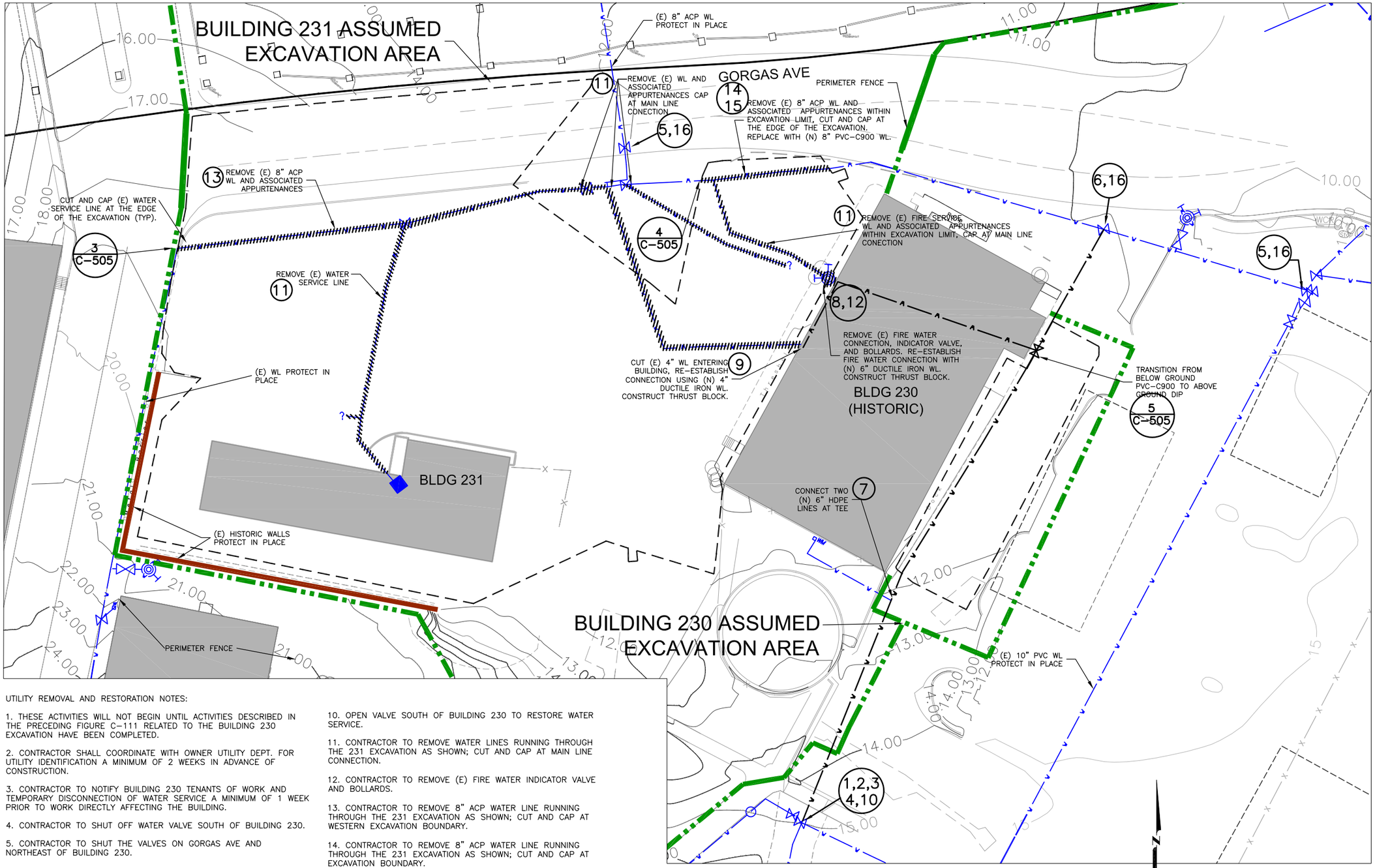
SHEET TITLE

**BUILDING 230 EXCAVATION WATER UTILITY PLAN SOUTH AREA**

**C-111**

SHEET 13 OF 33

4084075106047.DWG 20.0
20070905.1048




UTILITY REMOVAL AND RESTORATION NOTES:

1. THESE ACTIVITIES WILL NOT BEGIN UNTIL ACTIVITIES DESCRIBED IN THE PRECEDING FIGURE C-111 RELATED TO THE BUILDING 230 EXCAVATION HAVE BEEN COMPLETED.

2. CONTRACTOR SHALL COORDINATE WITH OWNER UTILITY DEPT. FOR UTILITY IDENTIFICATION A MINIMUM OF 2 WEEKS IN ADVANCE OF CONSTRUCTION.

3. CONTRACTOR TO NOTIFY BUILDING 230 TENANTS OF WORK AND TEMPORARY DISCONNECTION OF WATER SERVICE A MINIMUM OF 1 WEEK PRIOR TO WORK DIRECTLY AFFECTING THE BUILDING.

4. CONTRACTOR TO SHUT OFF WATER VALVE SOUTH OF BUILDING 230.

5. CONTRACTOR TO SHUT THE VALVES ON GORGAS AVE AND NORTHEAST OF BUILDING 230.

6. CONTRACTOR TO CONFIRM VALVE NORTH OF BUILDING 230 IS CLOSED.

7. CONTRACTOR TO JOIN THE TWO NEW 6" PVC-C900 LINES AT THE SOUTH EAST CORNER OF BUILDING 230.

8. CONTRACTOR TO REMOVE THE CURRENT FIRE WATER CONNECTION TO BUILDING 230 AND RE-ESTABLISH CONNECTION WITH NEW 6" DUCTILE IRON LINE RUNNING UNDER THE BUILDING.

9. CONTRACTOR TO CUT CURRENT 4" WATER LINE ENTERING BUILDING 230 FROM THE WEST AND RE-ESTABLISH CONNECTION USING THE NEW 4" DUCTILE IRON LINE RUNNING UNDERNEATH THE BUILDING.

10. OPEN VALVE SOUTH OF BUILDING 230 TO RESTORE WATER SERVICE.

11. CONTRACTOR TO REMOVE WATER LINES RUNNING THROUGH THE 231 EXCAVATION AS SHOWN; CUT AND CAP AT MAIN LINE CONNECTION.

12. CONTRACTOR TO REMOVE (E) FIRE WATER INDICATOR VALVE AND BOLLARDS.

13. CONTRACTOR TO REMOVE 8" ACP WATER LINE RUNNING THROUGH THE 231 EXCAVATION AS SHOWN; CUT AND CAP AT WESTERN EXCAVATION BOUNDARY.

14. CONTRACTOR TO REMOVE 8" ACP WATER LINE RUNNING THROUGH THE 231 EXCAVATION AS SHOWN; CUT AND CAP AT EXCAVATION BOUNDARY.

15. FOLLOWING SUCCESSFUL CONFIRMATION SAMPLING CONSTRUCT NEW 8" HDPE WATER LINE IN THE SAME LOCATION AS PREVIOUS ONE REMOVED, CONNECTING TO EXISTING ACP LINES AT THE EXCAVATION BOUNDARY.

16. CONTRACTOR TO TURN ON VALVES ON GORGAS AVE AND NORTHEAST OF BUILDING 230 AS SHOWN, THIS WILL RE-ESTABLISH THE WATER LOOP IN THIS AREA.

DRAWING REDUCED
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| 1 | 11/2007 | REVISED DRAFT |

PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106008.DWG
DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R .RAO



SHEET TITLE

**BUILDING 231 EXCAVATION WATER UTILITY PLAN SOUTH AREA**

**C-112**
SHEET 14 OF 33

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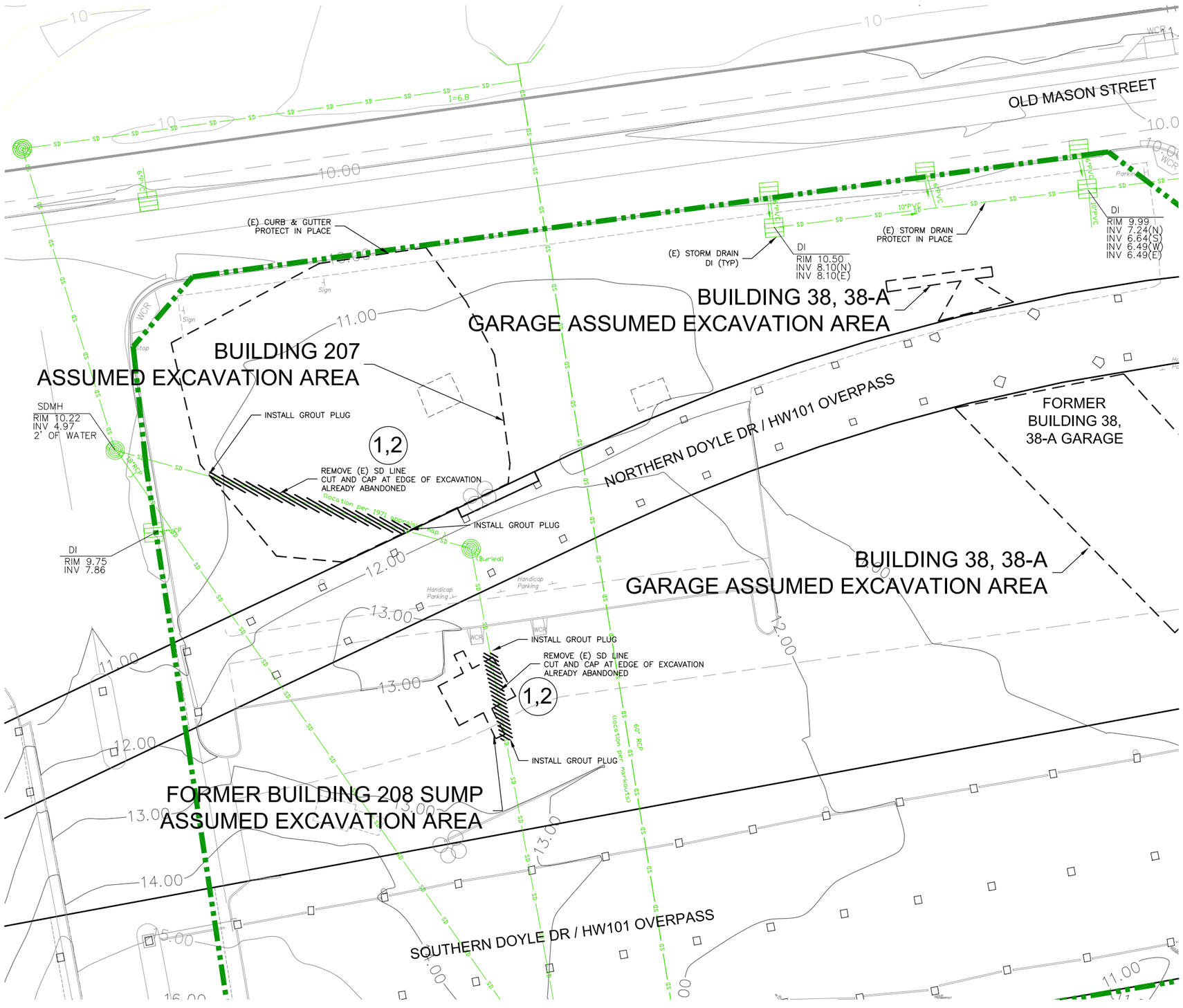


NOTES:

1. CONTRACTOR SHALL COORDINATE WITH OWNER'S UTILITY DEPT. FOR UTILITY IDENTIFICATION A MINIMUM OF 2 WEEKS IN ADVANCE OF CONSTRUCTION.

2. CONTRACTOR TO INSTALL GROUT PLUGS IN UPSTREAM AND DOWNSTREAM ENDS OF STORM DRAIN LINES AS SHOWN.

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PROJECT NO: 4084075106_07
CAD DWG FILE: 4084075106010.DWG
DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R.RAO



SHEET TITLE

**STORM DRAIN UTILITY PLAN NORTH AREA**

**C-113**
SHEET 15 OF 33

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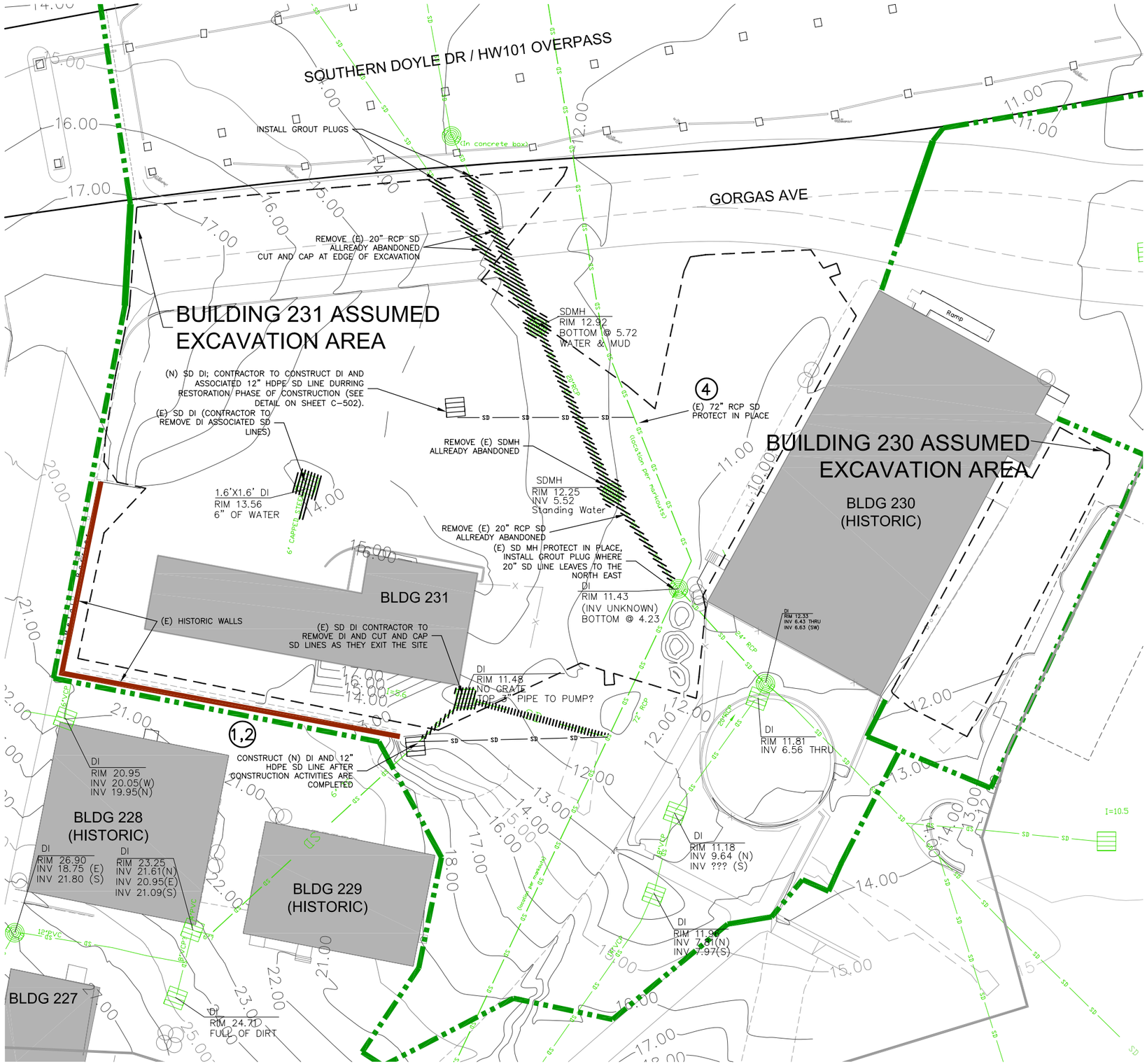


NOTES:

TEMPORARY INSTALLATION

1. CONTRACTOR SHALL COORDINATE WITH OWNER UTILITY DEPT. FOR UTILITY IDENTIFICATION A MINIMUM OF 2 WEEKS IN ADVANCE OF CONSTRUCTION.

2. CONTRACTOR TO CONSTRUCT (N) DI AT LOCATION SHOWN AND RUN (N) 12" SD LINE AS SHOWN. CONSTRUCTION TO BE PREFORMED IN ACCORDANCE WITH DETAIL 9 ON SHEET C-502 AND SPECIFICATIONS PROVIDED.

3. ALL DEMOLISHED MATERIALS TO BE RECYCLED IF POSSIBLE OR OTHERWISE DISPOSED. ASSUME NO MATERIALS TO BE SAVED UNLESS NOTED.

4. CONTRACTOR TO PROVIDE OWNER WITH A PLAN TO PROTECT 72" STORM DRAIN IN PLACE PRIOR TO CONSTRUCTION.

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# BUILDING 207/231 REMEDIATION

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PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106010.dwg
DRAWN/DESIGN BY: J HANZEL-DURBIN
CHECKED BY: R .RAO



SHEET TITLE

**STORM DRAIN UTILITY PLAN SOUTH AREA**

**C-114**
SHEET 16 OF 33

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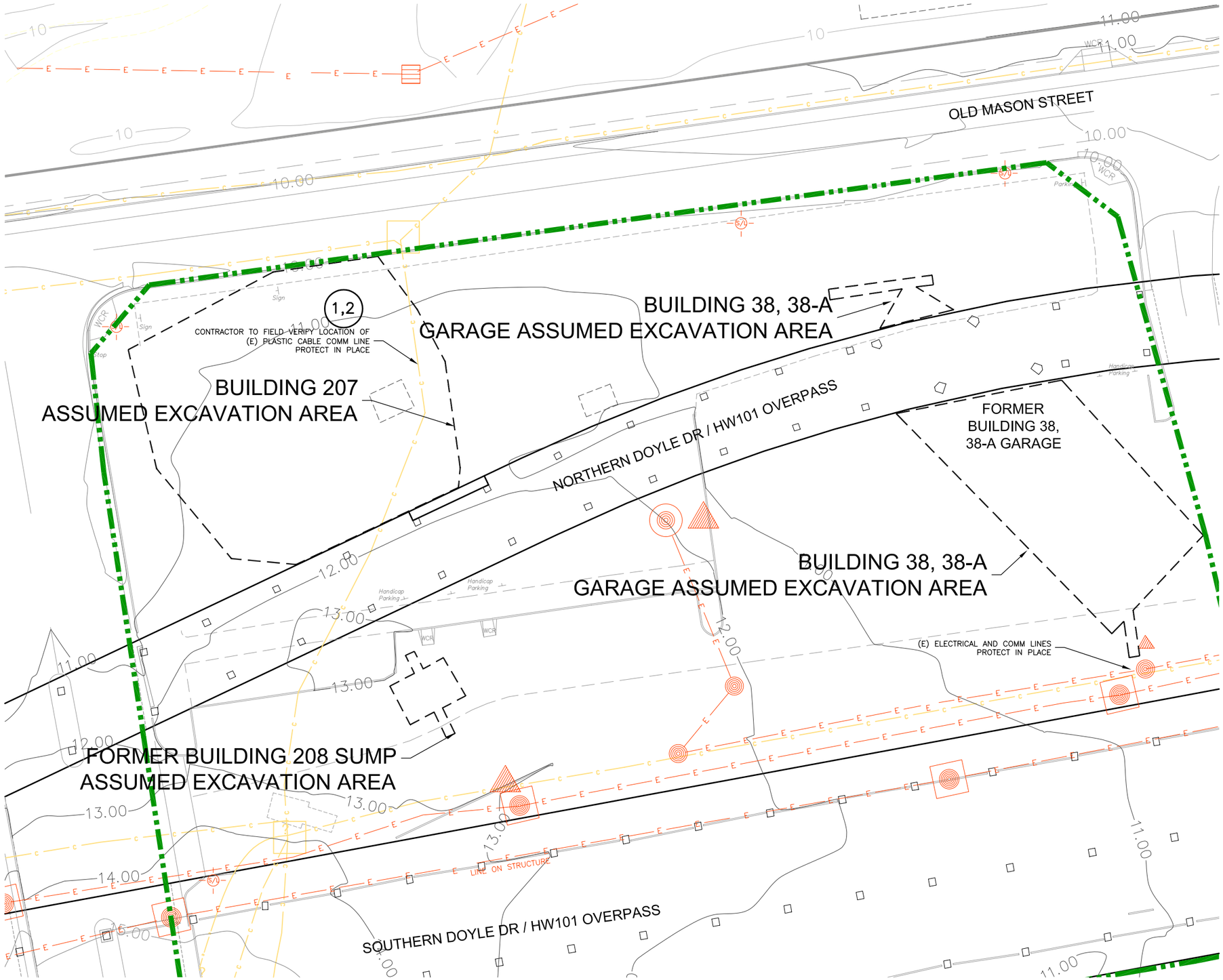


NOTES:

1. CONTRACTOR SHALL COORDINATE WITH OWNER'S UTILITY DEPT. FOR UTILITY IDENTIFICATION A MINIMUM OF 2 WEEKS IN ADVANCE OF CONSTRUCTION.

2. CONTRACTOR TO PROTECT ALL COMMUNICATION AND ELECTRICAL LINES IN AND AROUND THE ASSUMED EXCAVATION AREA USING BEST MANAGEMENT PRACTICES.

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PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106011.dwg
DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R.RAO



SHEET TITLE

**ELECTRICAL AND COMMUNICATION UTILITY PLAN NORTH AREA**

**C-115**
SHEET 17 OF 33

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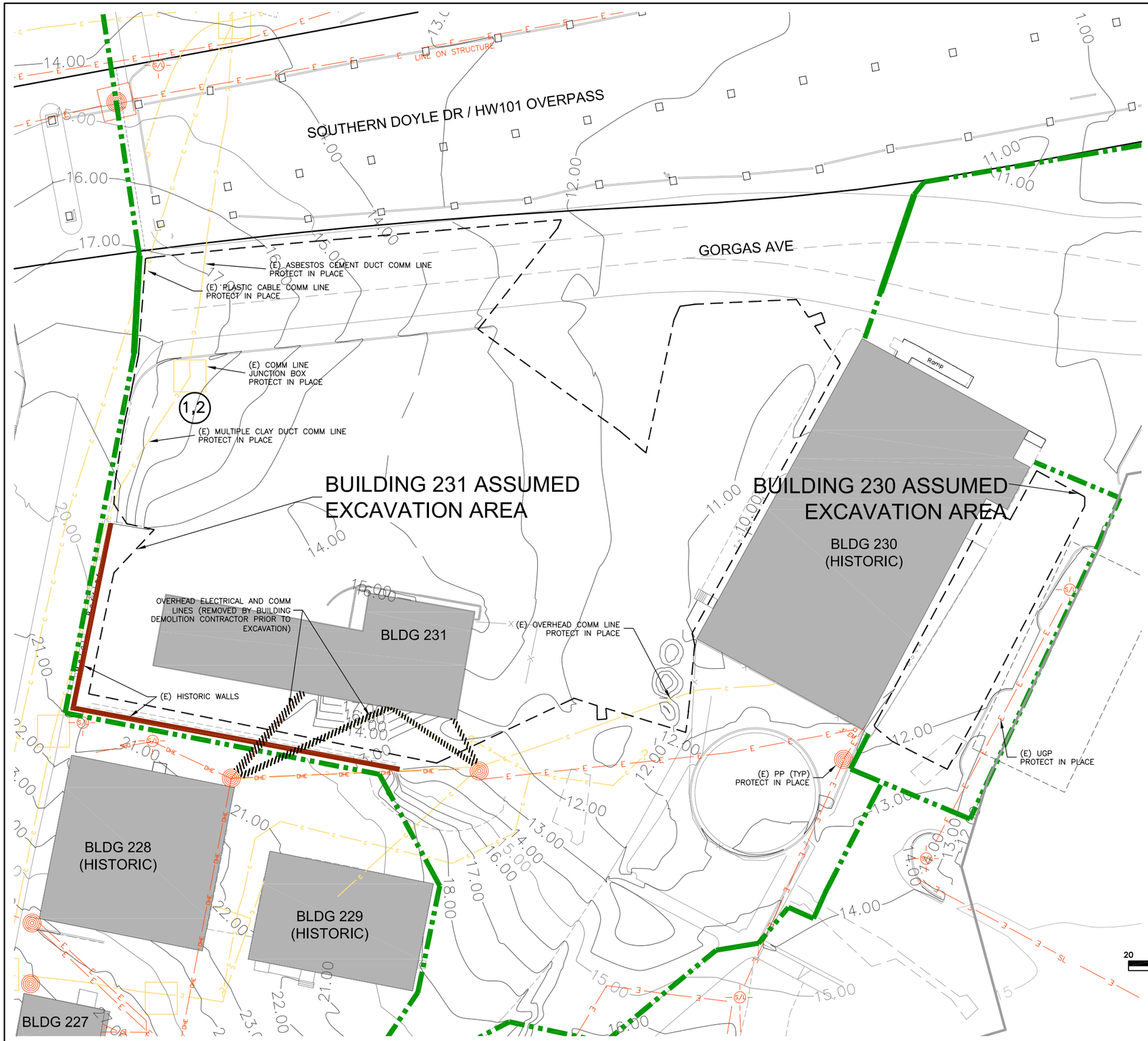


NOTES:

1. CONTRACTOR SHALL COORDINATE WITH OWNER UTILITY DEPT. FOR UTILITY IDENTIFICATION A MINIMUM OF 2 WEEKS IN ADVANCE OF CONSTRUCTION.

2. CONTRACTOR TO PROTECT ALL COMMUNICATION LINES INSIDE THE ASSUMED EXCAVATION AREA USING BEST MANAGMENT PRACTICES. PRIOR TO START OF EXCAVATION CONTRACTOR TO PROVIDE PLAN FOR PROTECTION OF COMMUNICATION LINES.

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# BUILDING 207/231 REMEDIATION

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| 1 | 11/2007 | REVISED DRAFT |

PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106011.DWG
DRAWN/DESIGN BY: J HANZEL-DURBIN
CHECKED BY: R.RAO



SHEET TITLE

## ELECTRICAL AND COMMUNICATION UTILITY PLAN SOUTH AREA

**C-116**
SHEET 18 OF 33

4084075106011.DWG 20.0
20070921.1356


DRAWING REDUCED
REFER TO GRAPHIC SCALE

NOTES:

1. CONTRACTOR SHALL COORDINATE WITH OWNER UTILITY DEPT. FOR UTILITY IDENTIFICATION A MINIMUM OF 2 WEEKS IN ADVANCE OF CONSTRUCTION.

2. CONTRACTOR TO INSTALL EJECTOR PUMPS IN MANHOLES SOUTH EAST OF BUILDING 228 AND SOUTH OF BUILDING 230, AS SHOWN.

3. CONTRACTOR TO CONSTRUCT MANHOLE AND INSTALL EJECTOR PUMP AT SOUTH WEST CORNER OF BUILDING 230 TO CAPTURE AND DIVERT SEWER WATER AWAY FROM THE EXCAVATION.

4. CONTRACTOR TO CONSTRUCT 175' OF TEMPORARY 4" HDPE SEWER LINE RUNNING FROM THE EJECTOR PUMP SOUTH EAST OF BUILDING 228 TO THE MANHOLE SOUTH OF BUILDING 230. THIS LINE WILL BE PLACED ABOVE GROUND USING STANDARD PROCEDURES IDENTIFIED IN THE SPECIFICATIONS.

5. CONTRACTOR TO CONSTRUCT 120' OF TEMPORARY 2" HDPE SEWER LINE RUNNING FROM THE EJECTOR PUMP AT THE SOUTH WEST OF BUILDING 230 TO THE MANHOLE SOUTH OF BUILDING 230. THIS LINE WILL BE PLACED ABOVE GROUND USING STANDARD PROCEDURES IDENTIFIED IN THE SPECIFICATIONS.

6. CONTRACTOR TO CONSTRUCT 440' OF TEMPORARY 4" HDPE SEWER LINE RUNNING FROM THE EJECTOR PUMP SOUTH OF BUILDING 230 TO THE MANHOLE ON EDIE ROAD. THIS LINE WILL BE PLACED ABOVEGROUND, EXCEPT AT DRIVEWAY/PATHWAY CROSSINGS. AT DRIVEWAY/PATHWAY CROSSINGS LINE WILL BE PLACED IN A 6" DEEP TRENCH TO PROVIDE ADEQUATE PROTECTION DURING OPERATION.

7. CONTRACTOR TO TEMPORARILY PLUG NORTH BOUND SEWER LINES INSIDE THE TWO MANHOLES WITH EJECTOR PUMPS.

8. CONTRACTOR TO PERIODICALLY CONFIRM EJECTOR PUMPS ARE RUNNING AND THERE ARE NO SEWAGE BACKUPS.

9. CONTRACTOR TO SECURE TEMPORARY SEWER PIPING ON EITHER SIDE OF DRIVEWAY WITH UNISTRUT OR EQUIVALENT.

10. CONTRACTOR TO REMOVE ALL SEWER LINES INSIDE THE EXCAVATION AREA, CUT AND TEMPORARILY CAP AT THE EDGE OF EXCAVATION, DISPOSE OF OFF SITE AND RECYCLE WHERE POSSIBLE.

11. CONTRACTOR TO REMOVE ALL SANITARY SEWER MAN HOLES INSIDE THE EXCAVATION AREA, DISPOSE OF OFF SITE AND RECYCLE WHERE POSSIBLE.

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REGISTERED PROFESSIONAL ENGINEER
RAMESH RAO
No. 051487
EXP. 06/30/09
CIVIL
STATE OF CALIFORNIA

# BUILDING 207/231 REMEDIATION

OWNER
PRESIDIO TRUST
34 GRAHAM STREET
P.O. BOX 29052
SAN FRANCISCO, CALIFORNIA
(415) 561 - 5300

THE PRESIDIO TRUST

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| 4 | 10/2008 | FINAL |
| 3 | 7/2008 | REVISED DRAFT |
| 2 | 2/2008 | REVISED DRAFT |
| 1 | 11/2007 | REVISED DRAFT |

PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106049.dwg
DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R .RAO



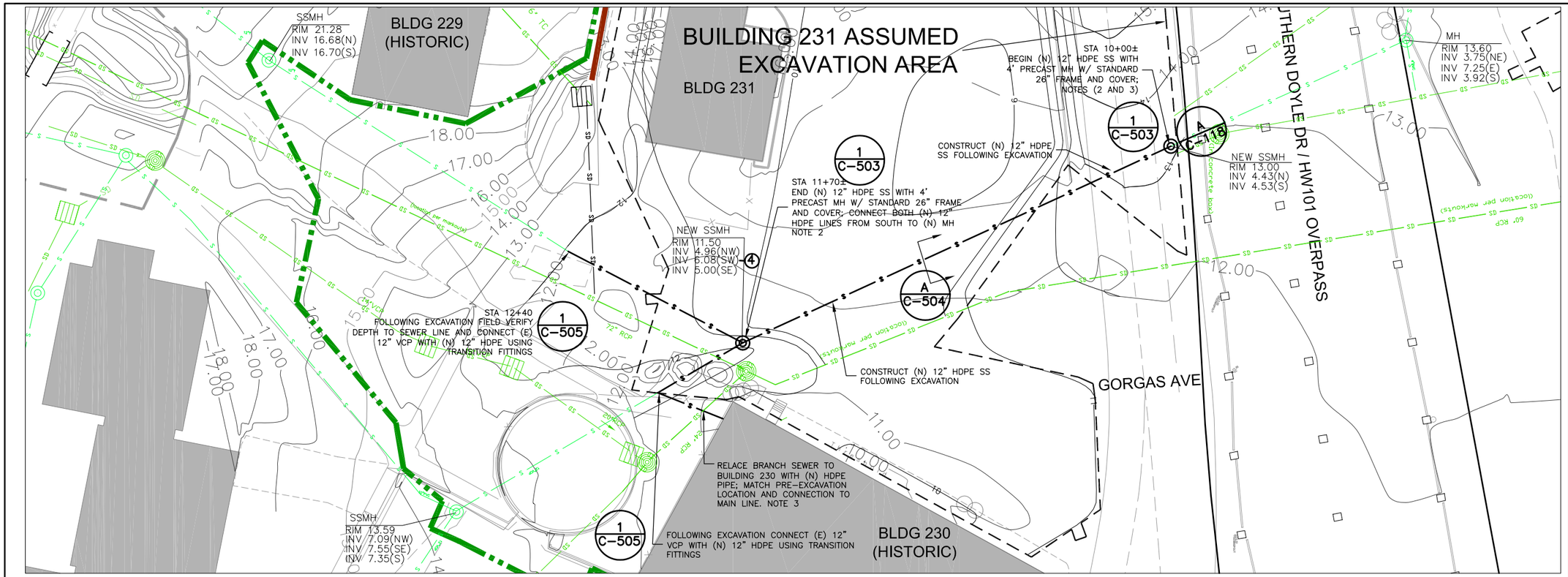
SHEET TITLE

## SANITARY SEWER UTILITY PLAN

## C-117

SHEET 19 OF 33

4084075106049.DWG 20.0
20081016.1119




PLAN

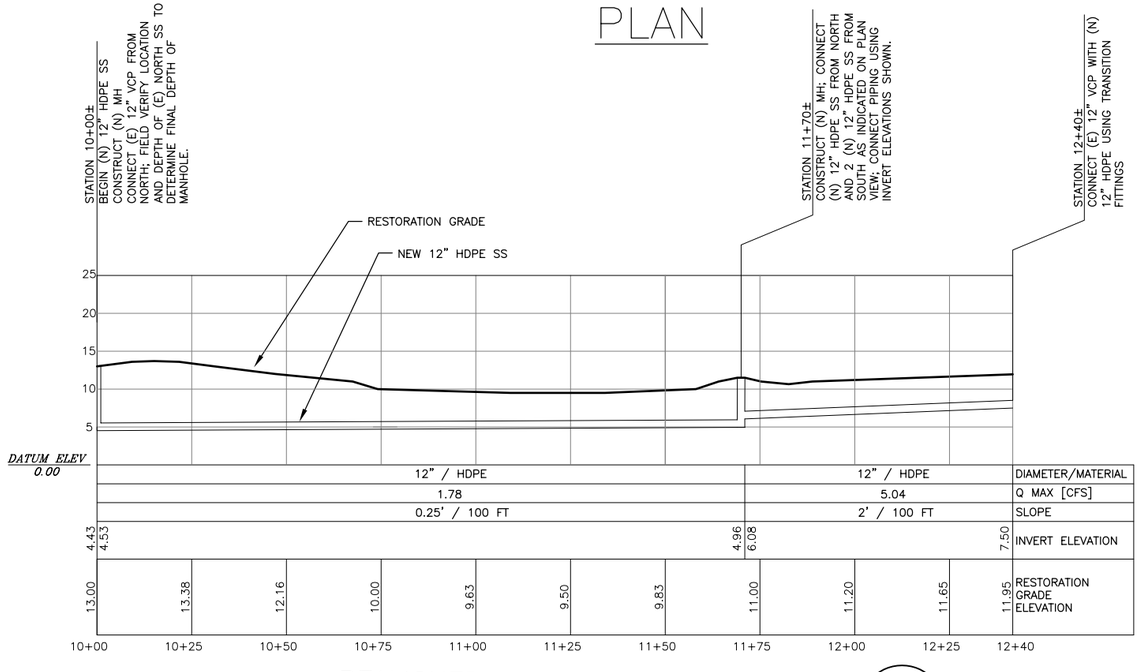
NOTES:

1. CONSTRUCTION SHALL NOT PROCEED WITH SANITARY SEWER CONSTRUCTION TILL BACKFILLING HAS BEEN COMPLETED.

2. CONSTRUCT MH'S ACCORDING TO THE STANDARD DETAIL FOR PRECAST CONCRETE MH'S FOUND ON SHEET C-503.

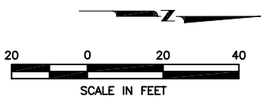
3. FIELD-FIT FINAL ALIGNMENT OF (N) SS BASED ON (E) UTILITIES LOCATED IN THE FIELD.

4. INVERT ELEVATION (SW) TO BE CONFIGURED ONCE THE ELEVATION AT TIE IN LOCATION NOTED ABOVE IS FIELD DETERMINED. MAINTAIN A MINIMUM SLOPE OF 1%.




REALIGNED SANITARY SEWER PROFILE A C118

SCALE: HORIZ : 1" = 20'
VERT : 1" = 10'




DRAWING REDUCED
REFER TO GRAPHIC SCALE

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REGISTERED PROFESSIONAL ENGINEER RAMESH RAO 051467 EXP. 06/30/09 CIVIL STATE OF CALIFORNIA

**BUILDING 207/231 REMEDIATION**

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(415) 561 - 5300

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| 1 | 11/2007 | REVISED DRAFT |

PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106062.DWG
DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R .RAO



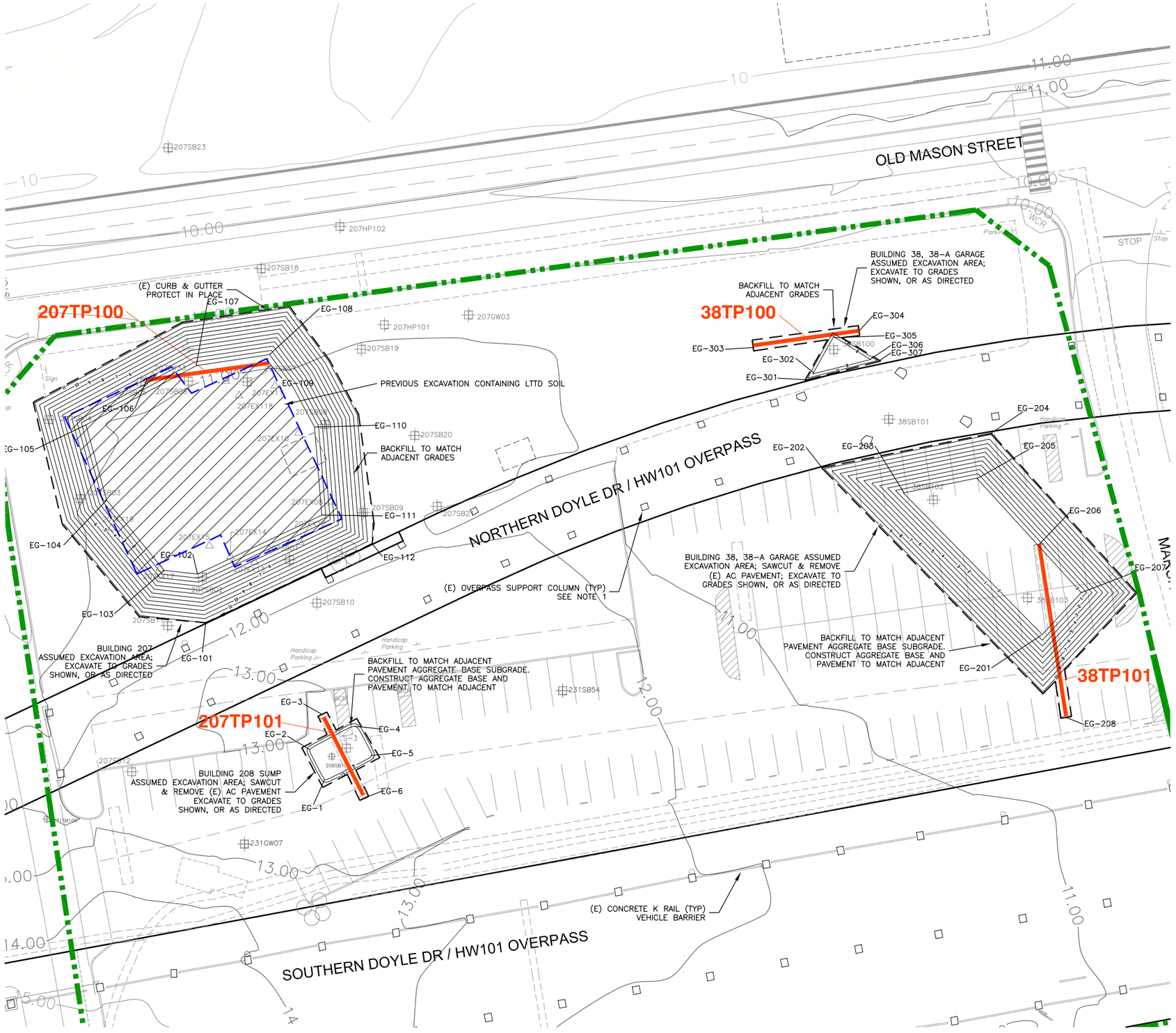
SHEET TITLE

**SANITARY SEWER REALIGNMENT PLAN AND PROFILE SOUTH AREA**

**C-118**

SHEET 20 OF 33

4084075106062.DWG 20.0
20071031.1640




NOTES:

1. EXCAVATION LIMIT AND DEPTH SUBJECT TO CHANGE. EXCAVATION SHALL NOT EXTEND BELOW EXISTING DOYLE DRIVE/HIGHWAY 101 OVERPASS.
2. CONTRACTOR TO EXCAVATE SOIL WITHIN THE LIMITS OF EXCAVATION AS DIRECTED WHILE MAINTAINING SAFE SIDEWALLS.
3. PIEZOMETERS AND GROUNDWATER MONITORING WELLS WITHIN EXCAVATION AREAS TO BE ABANDONED BY OTHERS PRIOR TO CONSTRUCTION.
4. CONTRACTOR TO COORDINATE A SURVEY OF AS-BUILT EXCAVATION AREAS PRIOR TO AND AFTER BACKFILL.
5. CONTRACTOR TO DECOMMISSION, PROTECT, OR REMOVE EXISTING UTILITIES IN ACCORDANCE WITH CONTRACT DRAWINGS.
6. CONTRACTOR SHALL COORDINATE WITH OWNER'S UTILITY DEPT. FOR UTILITY IDENTIFICATION A MINIMUM OF 2 WEEKS IN ADVANCE OF CONSTRUCTION.
7. CONTRACTOR TO COMPLETELY REMOVE ALL GEOARCHEOLOGICAL TRENCH BACKFILL. SURFACE CENTERLINE CONTROL POINTS ARE PROVIDED BELOW AND ACTUAL DEPTHS OF THE TRENCHES CAN BE FOUND IN THE GEOARCHEOLOGICAL TRENCH LOGS PROVIDED AS ATTACHMENT 1 OF THE WORK PLAN.
8. SURVEY CONTROL POINTS ARE LISTED ON DRAWING G-002.
9. CONTRACTOR SHALL MAINTAIN SIDEWALL SLOPE OF 1.5H:1V ON EXCAVATIONS ADJACENT TO CAL TRANS RIGHT OF WAY.
10. CONTRACTOR SHALL ENSURE STABILITY OF ALL SIDEWALL SLOPES. MAINTAIN A MINIMUM 1H:1V SIDEWALL SLOPE. FLATTEN SLOPE IF REQUIRED TO ENSURE STABILITY.

EXCAVATION CONTROL POINTS

| POINT | NORTHING | EASTING | ELEVATION |
|---|---|---|---|
| EG-1 | 480591.1 | 1435815.5 | 13.00 |
| EG-2 | 480602.6 | 1435809.8 | 13.00 |
| EG-3 | 480615.8 | 1435814.6 | 13.00 |
| EG-4 | 480611.3 | 1435827.2 | 13.00 |
| EG-5 | 480600.2 | 1435833.2 | 13.00 |
| EG-6 | 480584.1 | 1435830.6 | 13.00 |
| EG-101 | 480650.3 | 1435770.4 | 11.91 |
| EG-102 | 480659.7 | 1435769.1 | 11.35 |
| EG-103 | 480661.9 | 1435749.9 | 11.01 |
| EG-104 | 480692.8 | 1435724.5 | 10.62 |
| EG-105 | 480729.8 | 1435714.6 | 10.27 |
| EG-106 | 480742.5 | 1435748.1 | 10.96 |
| EG-107 | 480756.1 | 1435763.7 | 11.00 |
| EG-108 | 480761.8 | 1435798.8 | 11.58 |
| EG-109 | 480749.3 | 1435794.3 | 11.92 |
| EG-110 | 480726.9 | 1435820.5 | 11.92 |
| EG-111 | 480686.1 | 1435824.0 | 11.91 |
| EG-112 | 480680.5 | 1435833.7 | 11.92 |
| EG-201 | 480645.8 | 1436087.3 | 10.93 |
| EG-202 | 480709.6 | 1436004.0 | 10.55 |
| EG-203 | 480699.9 | 1436035.4 | 10.37 |
| EG-204 | 480722.4 | 1436068.4 | 10.73 |
| EG-205 | 480705.2 | 1436063.0 | 10.95 |
| EG-206 | 480680.3 | 1436086.6 | 11.92 |
| EG-207 | 480661.9 | 1436102.5 | 10.92 |
| EG-208 | 480614.7 | 1436096.8 | 10.99 |
| EG-301 | 480742.7 | 1435998.3 | 10.40 |
| EG-302 | 480745.4 | 1436001.0 | 10.15 |
| EG-303 | 480754.9 | 1435978.1 | 10.25 |
| EG-304 | 480761.4 | 1436018.6 | 10.40 |
| EG-305 | 480758.6 | 1436008.9 | 10.15 |
| EG-306 | 480750.3 | 1436022.3 | 10.25 |
| EG-307 | 480749.6 | 1436025.5 | 10.40 |

20 0 20 40
SCALE IN FEET

DRAWING REDUCED
REFER TO GRAPHIC SCALE

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# BUILDING 207/231 REMEDIATION

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PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106014.DWG
DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R .RAO



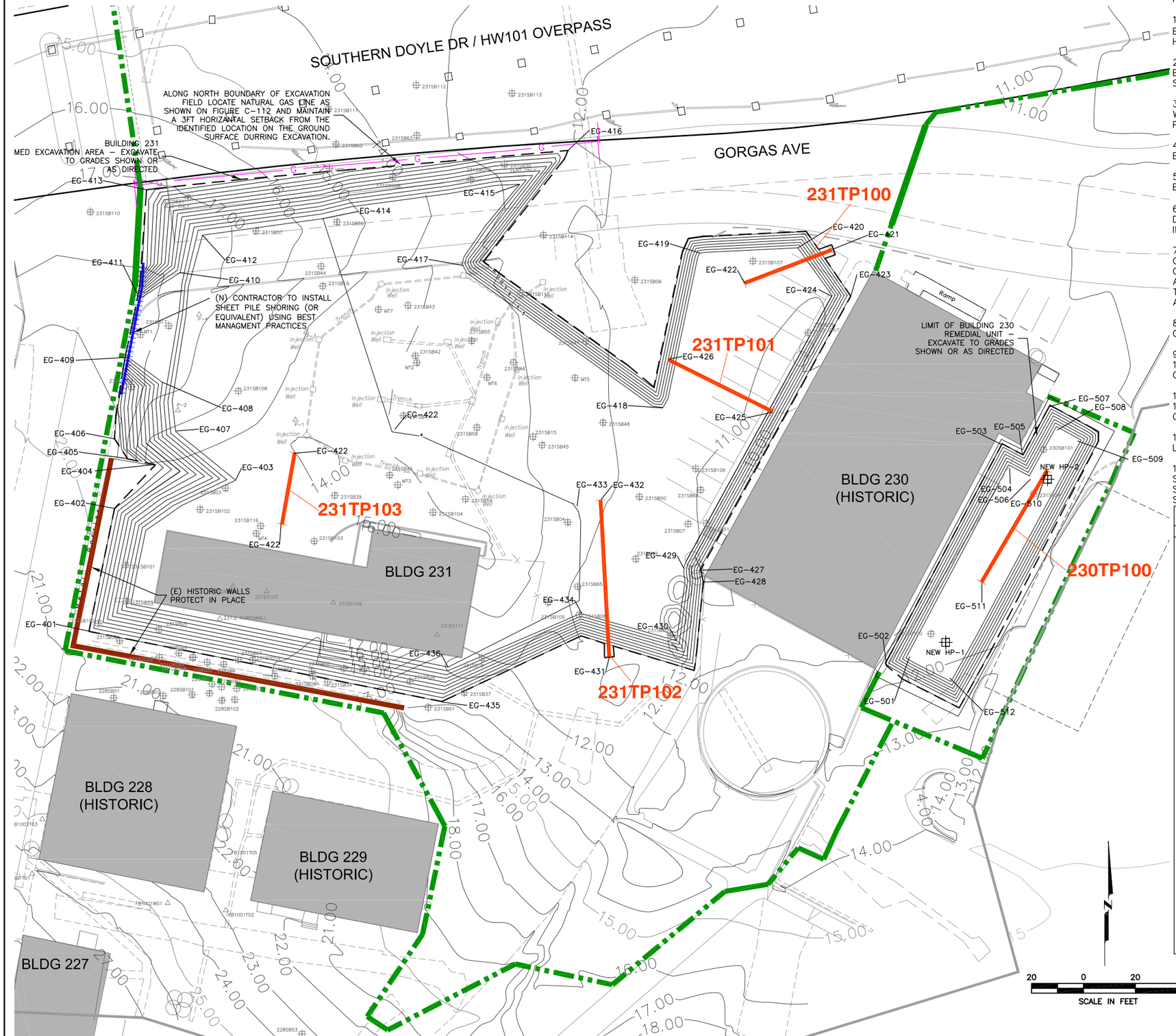
SHEET TITLE

## EXCAVATION PLAN NORTH AREA

## C-119

SHEET 21 OF 33

4084075106014.DWG 20.0
20081016.1107




NOTES:

1. EXCAVATION LIMITS AND DEPTH SUBJECT TO CHANGE. EXCAVATION WILL NOT EXTEND BELOW DOYLE DRIVE / HIGHWAY 101 OVERPASS.
2. CONTRACTOR TO EXCAVATE SOIL WITHIN THE LIMITS OF EXCAVATION AS DIRECTED, AND WILL MAINTAIN SAFE SIDEWALLS.
3. PIEZOMETERS AND GROUNDWATER MONITORING WELLS WITHIN EXCAVATION AREAS TO BE ABANDONED BY OTHERS PRIOR TO CONSTRUCTION.
4. CONTRACTOR TO COORDINATE SURVEYS OF AS–BUILT EXCAVATION AREAS PRIOR TO AND AFTER BACKFILL.
5. CONTRACTOR TO DECOMMISSION, PROTECT, OR REMOVE EXISTING UTILITIES AS INDICATED.
6. CONTRACTOR SHALL COORDINATE WITH OWNER'S UTILITY DEPT. FOR UTILITY IDENTIFICATION A MINIMUM OF 2 WEEKS IN ADVANCE OF CONSTRUCTION.
7. CONTRACTOR TO COMPLETELY REMOVE ALL GEOARCHEOLOGICAL TRENCH BACKFILL. SURFACE CENTERLINE CONTROL POINTS ARE PROVIDED BELOW AND ACTUAL DEPTHS OF THE TRENCHES CAN BE FOUND IN THE GEOARCHEOLOGICAL TRENCH LOGS PROVIDED AS ATTACHMENT 1 OF THE WORK PLAN.
8. SURVEY CONTROL POINTS ARE LISTED ON DRAWING G–002.
9. CONTRACTOR SHALL MAINTAIN SIDEWALL SLOPE OF 1.5H:1V ON EXCAVATIONS ADJACENT TO CAL TRANS RIGHT OF WAY.
10. CONTRACTOR SHALL MAINTAIN SIDEWALL SLOPE OF 1.5H:1V ADJACENT TO HISTORIC WALL ON THE SOUTHWEST CORNER OF THE BUILDING 231 EXCAVATION.
11. CONTRACTOR TO PROVIDE A SHORING DESIGN AT LOCATION SHOWN ON THIS SHEET.
12. CONTRACTOR SHALL ENSURE STABILITY OF ALL SIDEWALL SLOPES. MAINTAIN A MINIMUM 1H:1V SIDEWALL SLOPE. FLATTEN SLOPE IF REQUIRED TO ENSURE STABILITY.

EXCAVATION CONTROL POINTS

| POINT | NORTHING | EASTING | ELEVATION |
|---|---|---|---|
| EG–401 | 480281.9 | 1435710.9 | 14.60 |
| EG–402 | 480329.3 | 1435720.9 | 14.81 |
| EG–403 | 480340.2 | 1435767.5 | 14.60 |
| EG–404 | 480346.1 | 1435736.5 | 15.19 |
| EG–405 | 480348.4 | 1435725.9 | 17.95 |
| EG–406 | 480356.2 | 1435720.8 | 19.09 |
| EG–407 | 480358.9 | 1435744.0 | 15.85 |
| EG–408 | 480377.9 | 1435739.2 | 17.43 |
| EG–409 | 480387.6 | 1435725.9 | 18.36 |
| EG–410 | 480420.2 | 1435746.1 | 17.74 |
| EG–411 | 480410.2 | 1435730.5 | 18.12 |
| EG–412 | 480434.6 | 1435754.7 | 17.22 |
| EG–413 | 480452.1 | 1435733.1 | 17.09 |
| EG–414 | 480440.9 | 1435801.1 | 15.58 |
| EG–415 | 480454.2 | 1435876.9 | 12.76 |
| EG–416 | 480467.3 | 1435895.5 | 12.11 |
| EG–417 | 480422.9 | 1435855.1 | 13.36 |
| EG–418 | 480368.3 | 1435932.2 | 11.56 |
| EG–419 | 480427.6 | 1435946.2 | 11.52 |
| EG–420 | 480429.7 | 1435984.1 | 11.18 |
| EG–421 | 480429.3 | 1435997.7 | 11.09 |
| EG–422 | 480416.2 | 1435963.5 | 11.28 |
| EG–423 | 480411.2 | 1436004.4 | 11.00 |
| EG–424 | 480411.4 | 1435997.3 | 11.00 |
| EG–425 | 480366.6 | 1435974.4 | 10.17 |
| EG–426 | 480386.8 | 1436025.8 | 11.59 |
| EG–427 | 480305.3 | 1436078.4 | 11.00 |
| EG–428 | 480301.0 | 1436094.6 | 11.00 |
| EG–429 | 480306.8 | 1436042.2 | 11.46 |
| EG–430 | 480278.4 | 1436025.8 | 13.00 |
| EG–431 | 480272.3 | 1436078.4 | 11.42 |
| EG–432 | 480332.5 | 1436094.6 | 12.11 |
| EG–433 | 480328.1 | 1435710.9 | 12.39 |
| EG–434 | 480288.9 | 1435720.9 | 12.00 |
| EG–435 | 480254.9 | 1435767.5 | 12.89 |
| EG–436 | 480268.3 | 1435736.5 | 12.00 |
| EG–501 | 480278.4 | 1436025.8 | 13.00 |
| EG–502 | 480272.3 | 1436078.4 | 11.42 |
| EG–503 | 480332.5 | 1436094.6 | 12.11 |
| EG–504 | 480328.1 | 1435710.9 | 12.39 |
| EG–505 | 480288.9 | 1435720.9 | 12.00 |
| EG–506 | 480254.9 | 1435767.5 | 12.89 |
| EG–507 | 480268.3 | 1435736.5 | 12.00 |
| EG–508 | 480332.5 | 1436094.6 | 12.11 |
| EG–509 | 480328.1 | 1435710.9 | 12.39 |
| EG–510 | 480288.9 | 1435720.9 | 12.00 |
| EG–511 | 480254.9 | 1435767.5 | 12.89 |
| EG–512 | 480268.3 | 1435736.5 | 12.00 |

DRAWING REDUCED
REFER TO GRAPHIC SCALE

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# BUILDING 207/231 REMEDIATION

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| 1 | 11/2007 | REVISED DRAFT |

PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106015.DWG
DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R.RAO



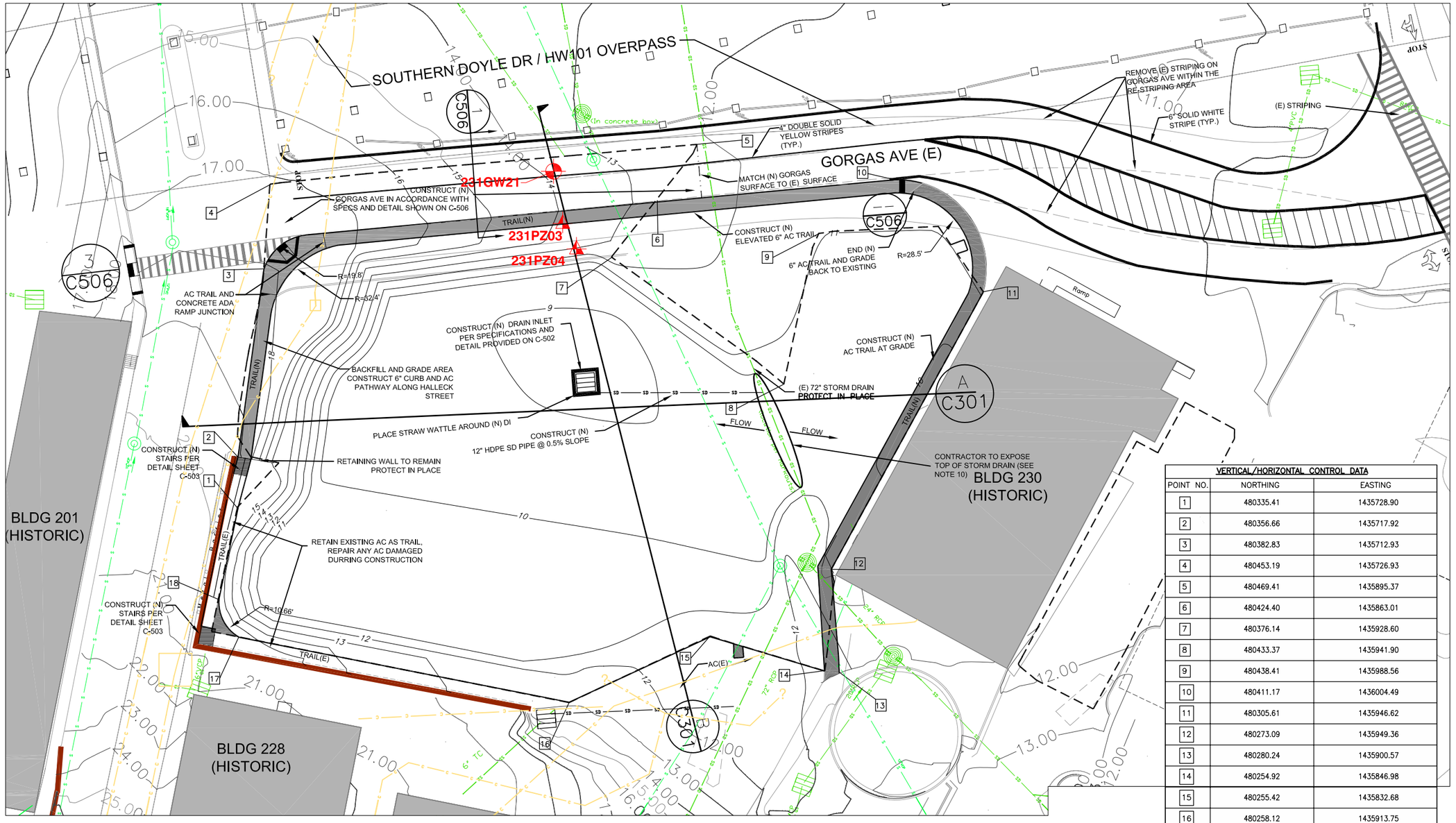
SHEET TITLE

## EXCAVATION PLAN SOUTH AREA

## C-120

SHEET 22 OF 33

4084075106015.DWG 20.0
20081016.1109




| VERTICAL/HORIZONTAL CONTROL DATA | | |
|---|---|---|
| POINT NO. | NORTHING | EASTING |
| 1 | 480335.41 | 1435728.90 |
| 2 | 480356.66 | 1435717.92 |
| 3 | 480382.83 | 1435712.93 |
| 4 | 480453.19 | 1435726.93 |
| 5 | 480469.41 | 1435895.37 |
| 6 | 480424.40 | 1435863.01 |
| 7 | 480376.14 | 1435928.60 |
| 8 | 480433.37 | 1435941.90 |
| 9 | 480438.41 | 1435988.56 |
| 10 | 480411.17 | 1436004.49 |
| 11 | 480305.61 | 1435946.62 |
| 12 | 480273.09 | 1435949.36 |
| 13 | 480280.24 | 1435900.57 |
| 14 | 480254.92 | 1435846.98 |
| 15 | 480255.42 | 1435832.68 |
| 16 | 480258.12 | 1435913.75 |
| 17 | 480263.48 | 1435943.88 |
| 18 | 480348.60 | 1435719.29 |

## CONSTRUCTION NOTES

1. SEE DWG G-002 FOR GENERAL NOTES, LEGEND & ABBREVIATIONS.
2. SEE DWG C-122 FOR PLAN AND PROFILE OF (N) GORGAS AVENUE AND (N) TRAIL
3. SEE DWG C-122 FOR (N) PVMT MARKINGS.
4. CONSTRUCT (N) GORGAS AVENUE TO MATCH (E) GORGAS AVENUE AS SHOWN.
5. CONSTRUCT (N) HANDICAPPED RAMPS PER CONSTRUCTION DRAWING DETAILS PRESENTED ON C-506.
6. ALL EXPOSED BACKFILL SURFACES SHALL BE REVEGITATED ACCORDING TO PRE APPROVED TRUST/NPS PLAN.
7. CONSTRUCT NEW AC TRAIL. (N) GORGAS AVENUE TRAIL SHALL SLOPE TO THE NORTH. (N) TRAIL ADJACENT TO BUILDING 230 SHALL SLOPE TOWARD DRAINAGE DITCH TO THE EAST.
8. (N) AC TRAIL SHALL CONFORM TO (E) AC WHERE (N) AC TRAIL MEETS (E) AS SHOWN. PROTECT (E) AC IN PLACE AS (E) AC SHALL SERVE AS TRAIL.
9. A TEMPORARY FENCE SHALL BE CONSTRUCTED BETWEEN THE TRAIL AND THE PROPOGATED PLANTING AREA TO DIRECT VISITORS AWAY FROM THE RESTORATION AREA.
10. IN THE VICINITY OF THE 72" STORM DRAIN THE FINAL SURFACE ELEVATION WILL BE RESTORED TO 10 FEET (NAVD 88). A PORTION OF THE 72" STORM DRAIN WILL BE EXPOSED PROVIDED ITS TOP IS ABOVE THE RESTORED ELEVATION.

N

0 20 40
SCALE IN FEET

DRAWING REDUCED
REFER TO GRAPHIC SCALE

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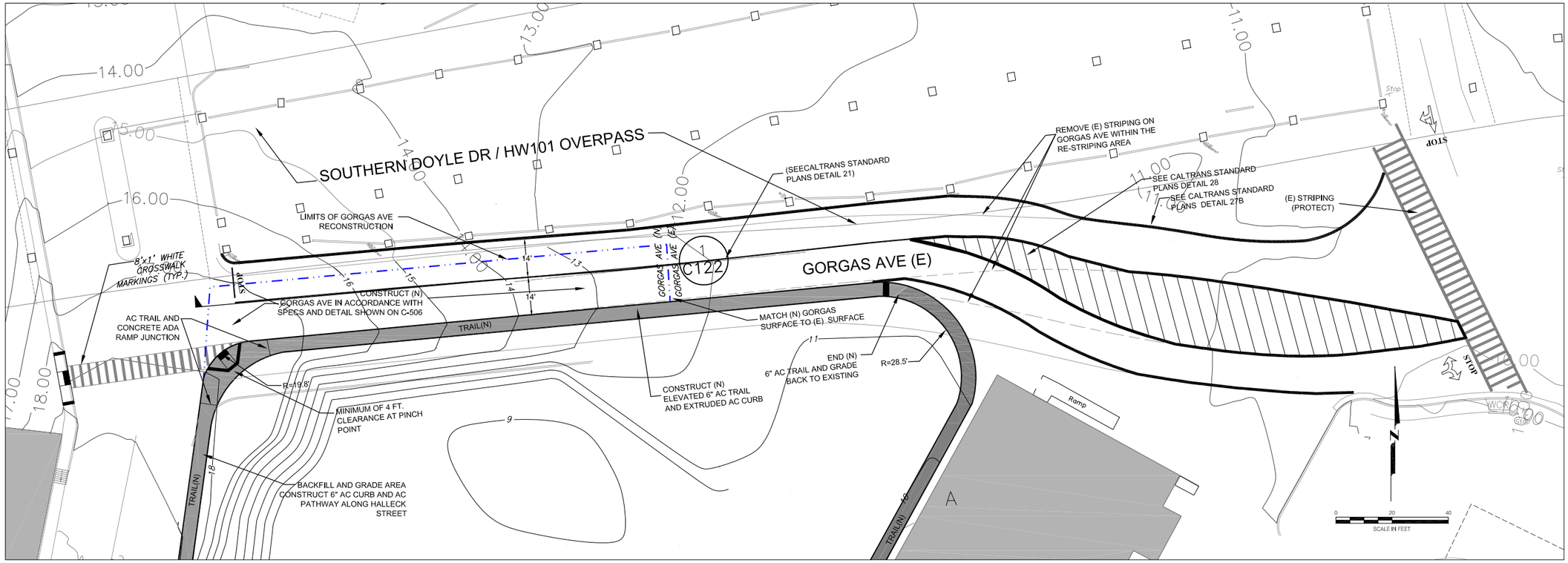
PROJECT NO: 4084075106_07
CAD DWG FILE: 4084075106051.DWG
DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R.RAO



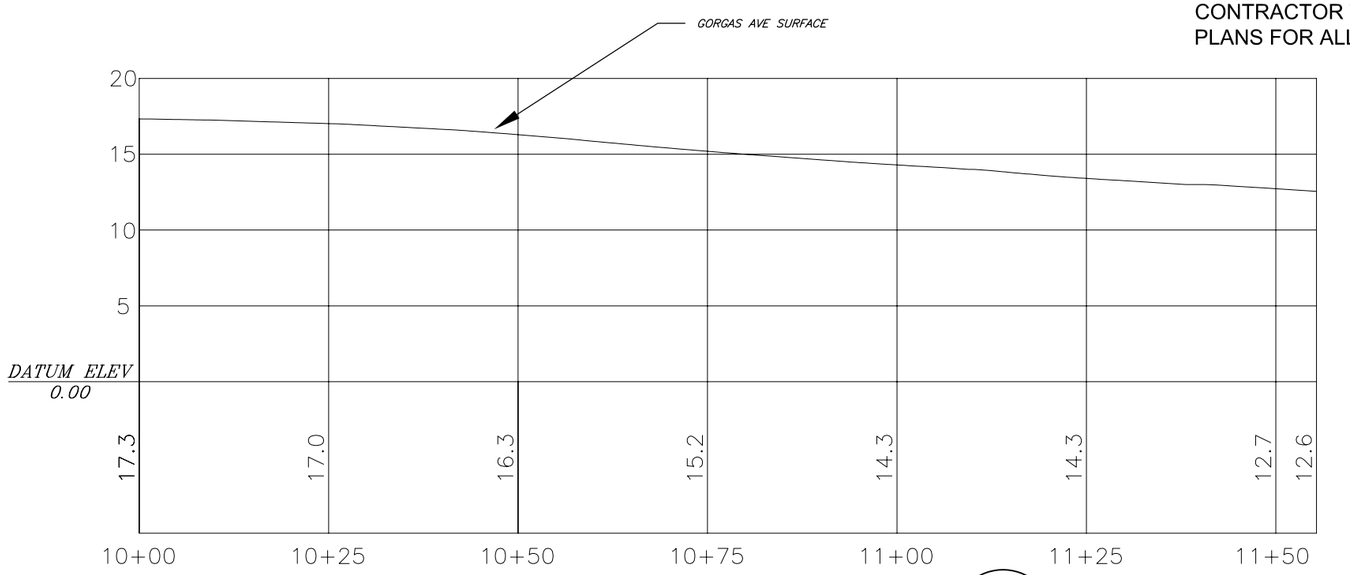
SHEET TITLE
**RESTORATION PLAN**

**C-121**
SHEET 23 OF 33

4084075106051.DWG 40.0
20071030.1620




GENERAL NOTE:
CONTRACTOR TO REFER TO CALTRANS STANDARD PLANS FOR ALL PAVEMENT MARKINGS.




GORGAS AVENUE PROFILE (1 / C122)

SCALE: HORIZ : 1" = 20'
VERT : 1" = 10'

DRAWING REDUCED
REFER TO GRAPHIC SCALE

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DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R.RAO



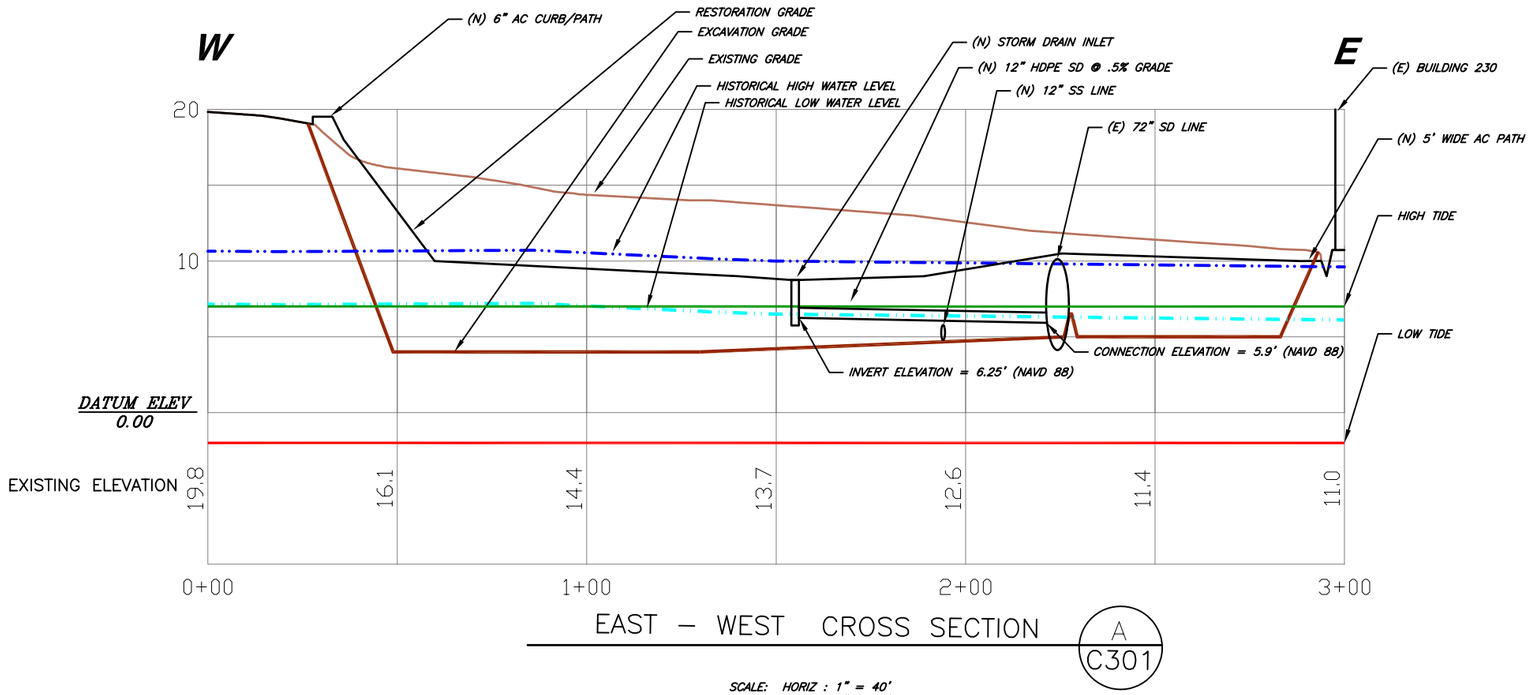
SHEET TITLE

## GORGAS AVENUE PLAN AND PROFILE

## C-122

SHEET 24 OF 33

4084075106053.DWG 40.0
20081016.1323




EAST – WEST CROSS SECTION

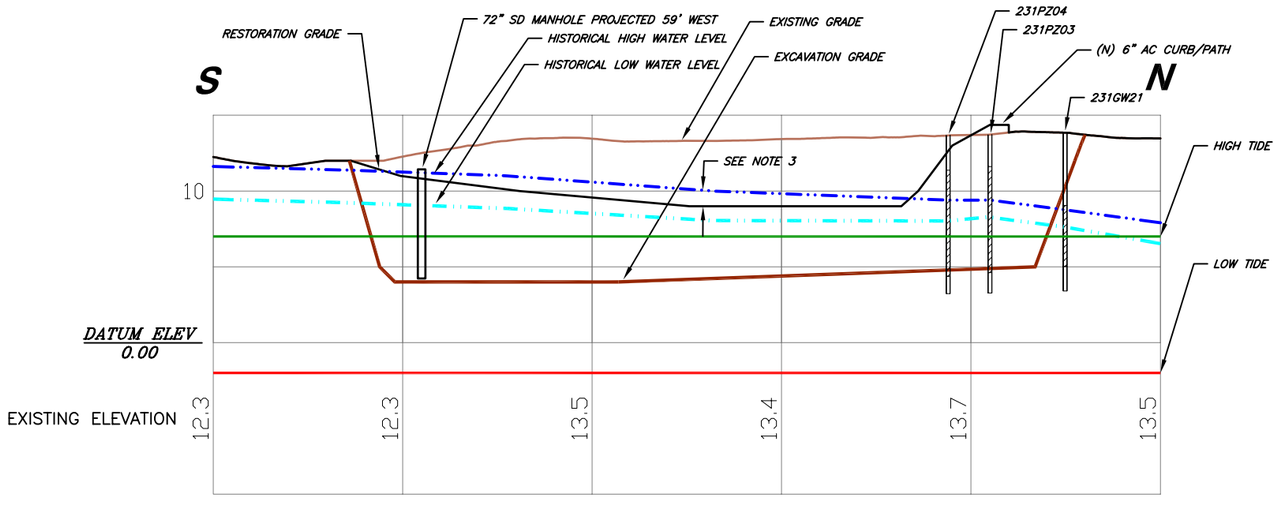
A / C301

SCALE: HORIZ : 1" = 40'
VERT : 1" = 10'

0 20 40
SCALE IN FEET

**NOTES:**

1. HIGH AND LOW TIDE ELEVATION DATA FROM 2006-2007, SOURCE: TIDE GAGE STATION #9414290(NORTH EAST SIDE OF NPS WHARF) NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION WEB SITE. http//co-ops.nos.noaa.gov/data_menu.shtml?stn=9414290%20San%20Francisco,%20CA&type=Historic+Tide+Data
2. HISTORICAL HIGH WATER LEVEL CONTOURS WERE DEVELOPED USING THE HIGHEST AND LOWEST REPORTED GROUNDWATER ELEVATION DATA FROM 2001 THROUGH 2006 FOUND IN THE PRESIDIO SEMI ANNUAL GROUNDWATER MONITORING REPORT 1ST AND 2ND QUARTERS 2006 (TREADWELL AND ROLLO, OCTOBER 2006)
3. THE DIFFERENCE BETWEEN HIGH WATER LEVEL AND RESTORATION GRADE DOES NOT EXCEED 1 FT.
4. VERTICAL DATUM FOR THESE CROSS-SECTIONS IS NAVD 88- US SURVEY FEET; ELEVATION MEASUREMENTS TAKEN IN PLLW WERE CONVERTED TO NAVD 88 TO BE CONSISTENT WITH TOPOGRAPHIC SURVEY DATA. CONVERSION: NAVD 88 = PLLW-0.37




NORTH – SOUTH CROSS SECTION

B / C301

SCALE: HORIZ : 1" = 40'
VERT : 1" = 10'

0 20 40
SCALE IN FEET

DRAWING REDUCED
REFER TO GRAPHIC SCALE

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28 Second Street, Suite 700
San Francisco, California 94105
(415) 543–8422

REGISTERED PROFESSIONAL ENGINEER — RAMESH RAO — 051467 — EXP: 06/30/09 — CIVIL — STATE OF CALIFORNIA

# BUILDING 207/231 REMEDIATION

OWNER
PRESIDIO TRUST
34 GRAHAM STREET
P.O. BOX 29052
SAN FRANCISCO, CALIFORNIA
(415) 561 - 5300

THE PRESIDIO TRUST

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PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106051.DWG
DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R.RAO



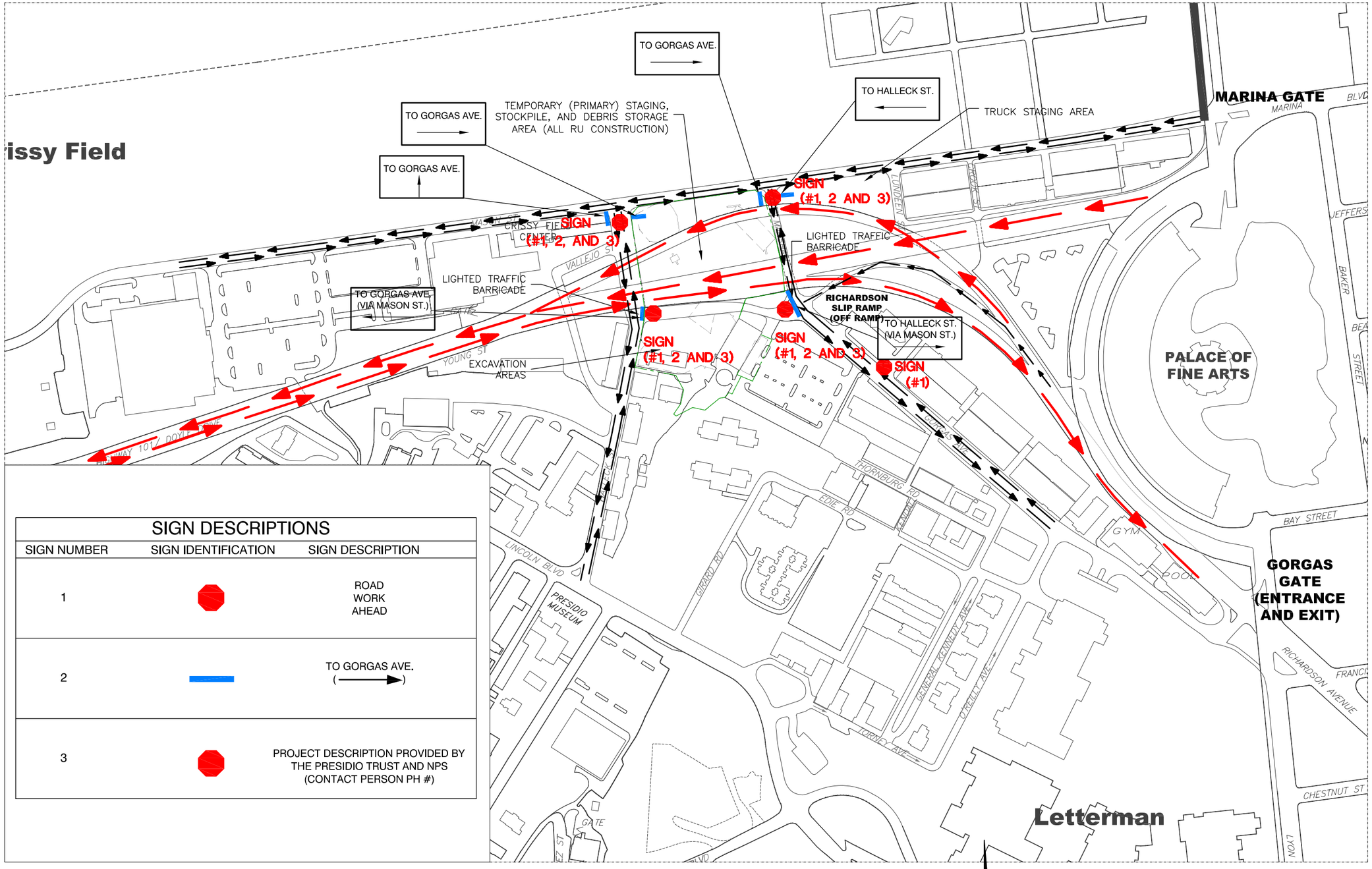
SHEET TITLE

## CROSS SECTIONS

## C-301

SHEET 25 OF 33

4084075106051.DWG 40.0
20071030.1620




## SIGN DESCRIPTIONS

| SIGN NUMBER | SIGN IDENTIFICATION | SIGN DESCRIPTION |
|---|---|---|
| 1 | | ROAD WORK AHEAD |
| 2 | | TO GORGAS AVE. ( → ) |
| 3 | | PROJECT DESCRIPTION PROVIDED BY THE PRESIDIO TRUST AND NPS (CONTACT PERSON PH #) |

LEGEND

DOYLE DRIVE/HWY 101 OVERPASS TRAFFIC
TWO DIRECTIONAL CITY STREET TRAFFIC
ASSUMED EXCAVATION AREAS
PERIMETER FENCE
TRAFFIC SIGN
DETOUR SIGN

N

150 0 150 300
SCALE IN FEET

DRAWING REDUCED
REFER TO GRAPHIC SCALE

NOTES:

1. SIGN 1 SHALL STATE THAT THERE IS A CONSTRUCTION AREA AHEAD AND POSSIBLE TRAFFIC DELAYS.
2. SIGN 2 SHALL STATE THAT THERE IS A TRAFFIC DETOUR AHEAD.
3. ACTUAL SIGNAGE TO BE DETERMINED AT A LATER DATE WITH STAKE HOLDER INPUT.

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CAD DWG FILE: 4084075106039.DWG
DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R.RAO

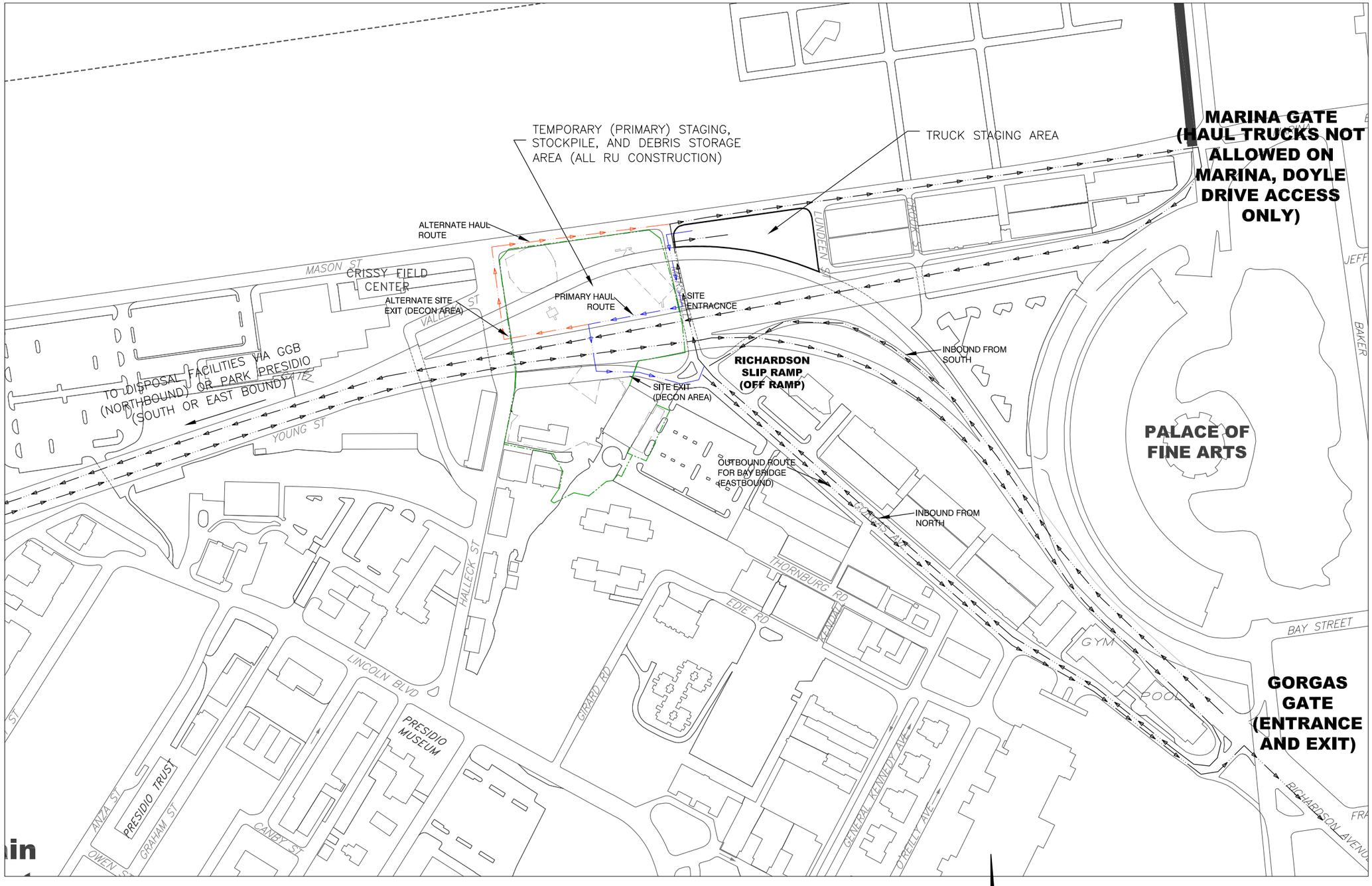


SHEET TITLE

## TRANSPORTATION PLAN

**C-401**

SHEET 26 OF 33




LEGEND

- TRUCK HAUL ROUTES AROUND SITE
- PRIMARY TRUCK HUAL ROUTE THROUGH SITE
- ALTERNATIVE TRUCK HAUL ROUTE
- ASSUMED EXCAVATION AREAS
- PERIMETER FENCE

N

125 0 125 250

SCALE IN FEET

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REFER TO GRAPHIC SCALE

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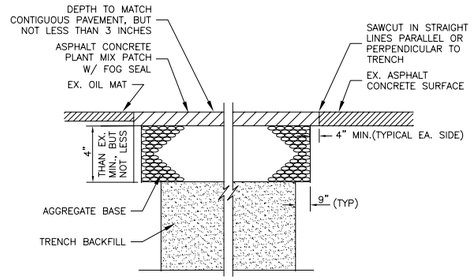
SHEET TITLE

**TRUCK HAUL ROUTES PLAN**

**C-402**

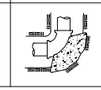
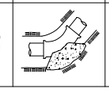
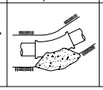
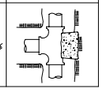
SHEET 27 OF 33




NOTE:

1. IF SAWCUT IS WITHIN 24" OF EDGE OF A.C. PAVEMENT REMOVE EXISTING PAVEMENT TO THAT EDGE AND REPLACE ENTIRE SECTION.

A.C. PAVEMENT PATCH — NTS — 1 / –

| TYPE OF FITTING | 90° BEND | 45° BEND | 11-1/4° OR 22-1/2° BEND | TEE/DEAD END |
|---|---|---|---|---|
| TYPICAL INSTALLATION |  |  |  |  |

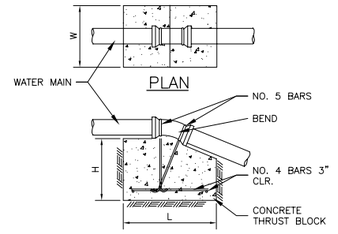
THRUST BLOCK BEARING AREA (SQ. FT.)

| SIZE OF PIPE | 90° BEND | 45° BEND | 22 1/2° BEND | 11 1/4° BEND | VALVE TEE OR DEAD END |
|---|---|---|---|---|---|
| 4" | 2 | 1 | 1 | 1 | 2 |
| 6" | 5 | 3 | 2 | 1 | 3 |
| 8" | 8 | 4 | 2 | 1 | 6 |
| 10" | 12 | 6 | 3 | 2 | 8 |
| 12" | 16 | 9 | 5 | 3 | 12 |
| 14" | 22 | 12 | 6 | 3 | 16 |
| 16" | 28 | 16 | 8 | 4 | 20 |
| 18" | 35 | 19 | 10 | 5 | 25 |
| 20" | 43 | 24 | 12 | 6 | 31 |

NOTES:

1. THRUST BLOCKS TO BE CONSTRUCTED OF MIN. 3000 PSI CONCRETE.
2. AREAS GIVEN ARE FOR PC150 OR PR165 PIPE AT TEST PRESSURE OF 165 PSI., WITH 2000 PSF BEARING CAPACITY. INSTALLATIONS USING DIFFERENT PIPE, TEST PRESSURES AND/OR SOIL TYPES WILL REQUIRE ADJUSTED BEARING AREAS ACCORDINGLY, SUBJECT TO APPROVAL OF ENGINEER.
3. BLOCKS TO BE POURED AGAINST UNDISTURBED SOIL.
4. JOINTS AND FACE OF PLUGS TO BE KEPT CLEAR OF CONCRETE.
5. CONSTRUCT THRUST BLOCK BEARING SURFACE APPROXIMATELY SQUARE.
6. THRUST BLOCK THICKNESS SHALL BE AT LEAST 1/2 THE WIDTH OF THE THRUST BLOCK (1/2 $\sqrt{\text{BEARING AREA}}$).
7. BEARING SURFACE AREA FOR GATE VALVES IS EACH FACE PERPENDICULAR TO WATERLINE.

THRUST BLOCK AREAS — NTS — 2 / –




ELEVATION

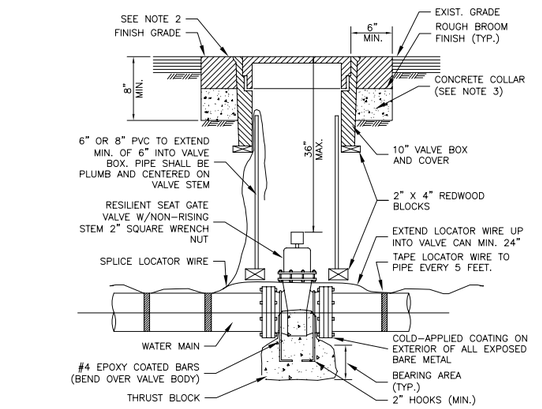
DIMENSIONS

| PIPE SIZE | 11.25° BEND L | W | H | 22.5° BEND L | W | H | 45° BEND L | W | H |
|---|---|---|---|---|---|---|---|---|---|
| 6" | 2'-0" | 1'-2" | 1'-1" | 2'-0" | 2'-0" | 1'-9" | 3'-0" | 2'-0" | 3'-0" |
| 8" | 2'-6" | 1'-6" | 1'-6" | 3'-0" | 2'-6" | 1'-6" | 4'-6" | 2'-6" | 2'-9" |
| 10" | 3'-0" | 2'-0" | 1'-6" | 4'-0" | 2'-6" | 2'-0" | 5'-0" | 3'-0" | 3'-3" |
| 12" | 3'-6" | 2'-0" | 2'-0" | 5-0" | 2'-6" | 2'-6" | 6'-0" | 3'-6" | 3'-6" |
| 14" | 4'-0" | 2'-6" | 1'-9" | 6'-0" | 3'-0" | 2'-3" | 7'-0" | 4'-0" | 3'-6" |
| 16" | 4'-6" | 2'-6" | 2'-6" | 6'-0" | 3'-6" | 2'-9" | 7'-0" | 4'-6" | 4'-3" |
| 18" | 5'-0" | 3'-0" | 2'-0" | 6'-6" | 4'-0" | 2'-9" | 8'-0" | 5'-0" | 4'-3" |
| 20" | 5'-6" | 3'-0" | 2'-9" | 7'-0" | 4'-6" | 3'-0" | 9'-0" | 5'-6" | 4'-3" |

NOTES:

1. CONCRETE SHALL BE MIN. 3000 PSI PORTLAND CEMENT CONCRETE.
2. REINFORCING STEEL SHALL BE EPOXY COATED.
3. VOLUMES GIVEN ARE FOR PIPE AT TEST PRESSURE 165 PSI AND NORMAL WEIGHT CONCRETE (145 LB PER CU FT). INSTALLATIONS USING DIFFERENT TEST PRESSURES OR WEIGHT OF CONCRETE SHOULD ADJUST VOLUMES ACCORDINGLY.
4. JOINTS SHALL BE KEPT CLEAR OF CONCRETE.

THRUST BLOCK FOR UPWARD THRUST — NTS — 3 / –

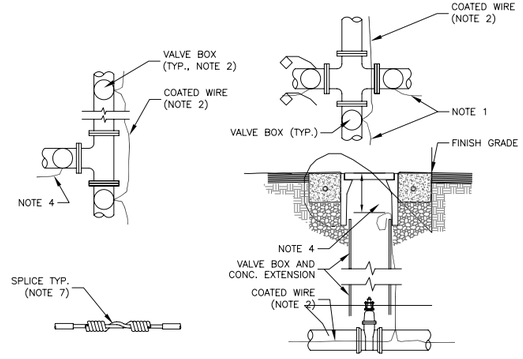



NOTES:

1. SEE THRUST BLOCK BEARING AREA DETAIL FOR SIZE. (MATERIAL USED FOR THRUST BLOCKING SHOULD NOT PREVENT ACCESS TO THE BOLT ASSEMBLY).
2. IN ALL AREAS, LIDS SHALL BE SET FLUSH WITH FINISH GRADE UNLESS OTHERWISE NOTED.
3. THE CONCRETE COLLAR SHALL BE LEFT 2-1/2" – 3" BELOW FINISHED ASPHALT SURFACE. APPLY TACK COAT AND FILL VOID BETWEEN ADJACENT PAVEMENT AND FRAME WITH TYPE 3 A.C. PAVING. CHIP OR FOG SEAL PAVED SURFACE. EXCEPTION: WHEN STRUCTURE NOT LOCATED IN ASPHALT PAVEMENT OR IN AN UNPAVED AREA, EXTEND CONCRETE TO FINISH GRADE. ALL CUTS IN A.C. SHALL BE STRAIGHT AND EVEN.
4. ONE CARSONITE POST SHALL BE INSTALLED 3' OFFSET FROM EACH GATE VALVE OR VALVE CLUSTER. WHEN LOCATED WITHIN A ROADWAY, THE CARSONITE POST SHALL BE INSTALLED 5' OUTSIDE THE SHOULDER NEAREST THE VALVE. THE COLOR SHALL BE BLUE AND SHALL INCLUDE A BLUE OR WHITE REFLECTIVE STRIP. POST SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S REQUIREMENTS.

GATE VALVE ASSEMBLY — NTS — 4 / –

# TYPICAL DETAILS




SPLICE DETAIL — DETAIL AT BOX

NOTES:

1. LOCATING WIRE SHALL BE INSTALLED WITH ALL MAINS AND OFF STREET FIRE SERVICES AND HYDRANTS.
2. WIRE SHALL BE CONTINUOUS BETWEEN VALVE BOXES, EXCEPT WHERE BOXES ARE WITHIN TEN (10) FEET OF PIPE INTERSECTION.
3. COATED WIRE SHALL NOT TOUCH VALVE OR FITTINGS (MAINTAIN 3 INCHES CLEAR DISTANCE).
4. LOCATING WIRE SHALL BE PLACED AT SPRING LINE OF PIPE, NEXT TO PIPE. (DO NOT ATTACH WIRE TO PIPE).
5. IF WIRE ENDS AT A VALVE, A SINGLE INSULATED WIRE SHALL EXTEND UP TO WITHIN 12" OF BOX COVER.
6. ALL VALVES, INCLUDING FIRE HYDRANT VALVES, SHALL HAVE LOCATING WIRES. INSIDE THE VALVE BOX AS SHOWN.
7. ALL SPLICE INSTALLATIONS SHALL BE WITHIN THE VALVE BOX.

LOCATOR WIRE — NTS — 5 / –

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CAD DWG FILE: 4084075106050.DWG
DRAWN/DESIGN BY: J HANZEL-DURBIN
CHECKED BY: R.RAO

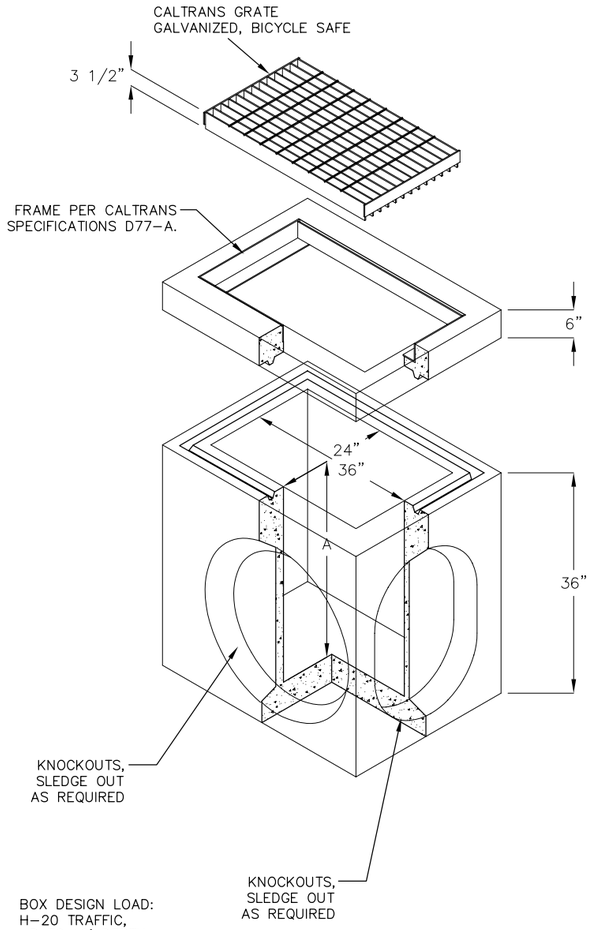


SHEET TITLE

**SECTIONS AND DETAILS**

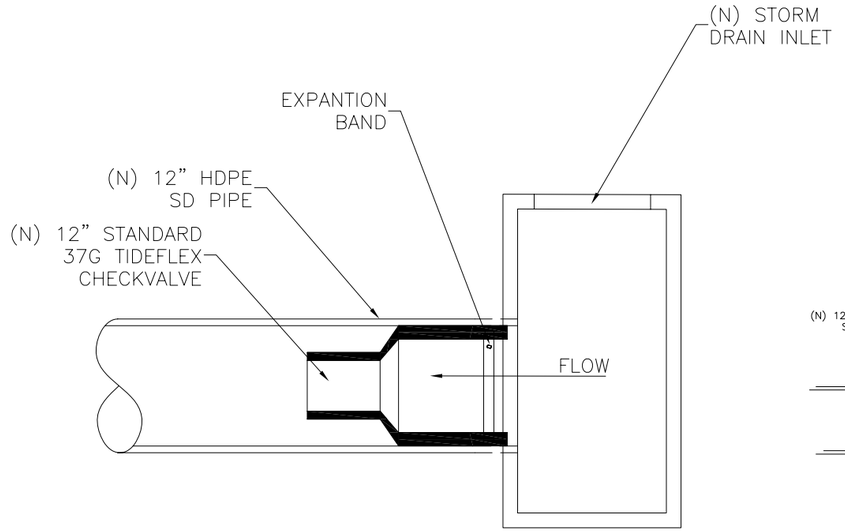
**C-501**

SHEET 28 OF 33

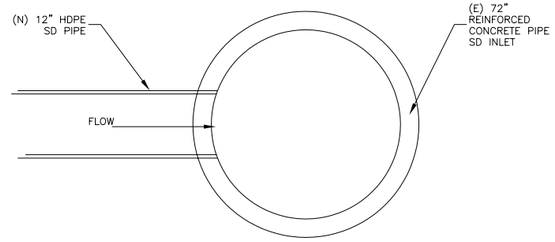



BOX DESIGN LOAD:
H-20 TRAFFIC,
UP TO 12' DEPTH.

CALTRANS DROP INLET
TYPE G1 (1)
N.T.S.




STORM WATER DRAIN INLET DISCHARGE / CHECKVALVE (2)
NTS




STORM WATER INLET DETAIL – PLAN (3)
NTS

NOTES:

1. PRECAST REINFORCED CONCRETE PIPE SHALL BE IN ACCORDANCE WITH THE CURRENT ASTM STANDARD SPECIFICATIONS FOR REINFORCED CONCRETE CULVERT STORM DRAIN AND SEWER PIPE, DESIGNATION C-76.

2. THE 12" PVC SD PIPE CULVERT CONNECTION SHALL BE MADE BY CHIPPING OUT IN ACCORDANCE WITH SECTION 304.08 OF THE STANDARD SPECIFICATIONS.

# TYPICAL DETAILS

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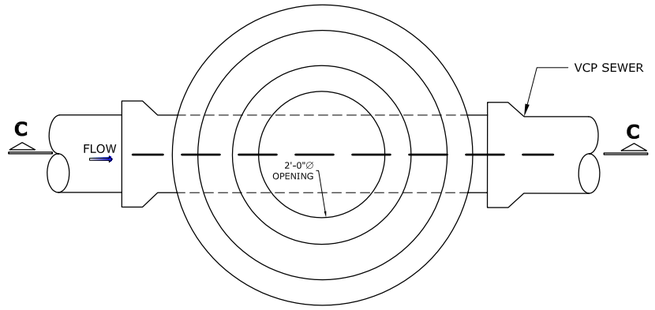
CHECKED BY: R.RAO

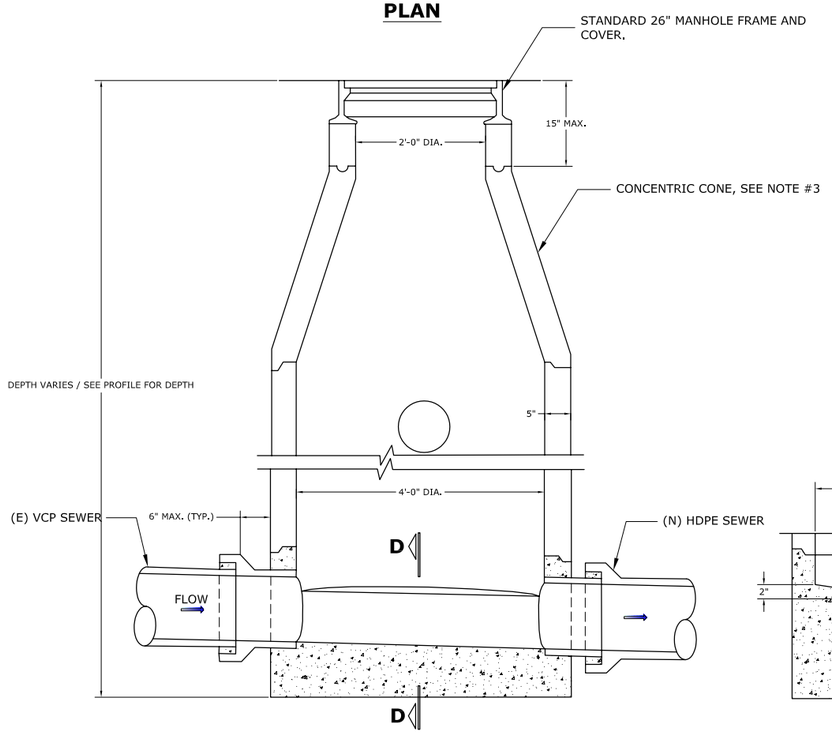


SHEET TITLE
**SECTIONS AND DETAILS**

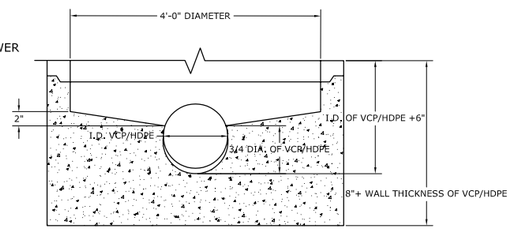
**C-502**
SHEET 29 OF 33




**PLAN**




**SECTION C-C**




**SECTION D-D**

## NOTES

1. MANHOLE FRAME AND ALL JOINTS SHALL BE SET IN CLASS "C" MORTAR.

2. ALL PRECAST COMPONENTS SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C-478.

3. VERTICAL WALL OF CONCENTRIC CONE SHALL BE ON UPSTREAM SIDE OF MANHOLE, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

4. STEEL REINFORCEMENT IN CONCRETE FOUNDATION IS NOT REQUIRED IF MANHOLE IS NOT PILE SUPPORTED.

5. SIDE SEWER CONNECTIONS TO THE MANHOLE SHALL NOT BE HIGHER THAN 12" ABOVE THE INVERT OF THE MANHOLE.

**MANHOLE PLAN AND DETAILS**

# MANHOLE PLAN AND DETAILS

N.T.S

1
C–112

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REFER TO GRAPHIC SCALE

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REGISTERED PROFESSIONAL ENGINEER RAVINDRA S. HOMKAR 051467 EXP. 06/30/09 CIVIL STATE OF CALIFORNIA

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DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R. RAO



SHEET TITLE

**SECTIONS AND DETAILS**

**C-503**

SHEET 30 OF 33

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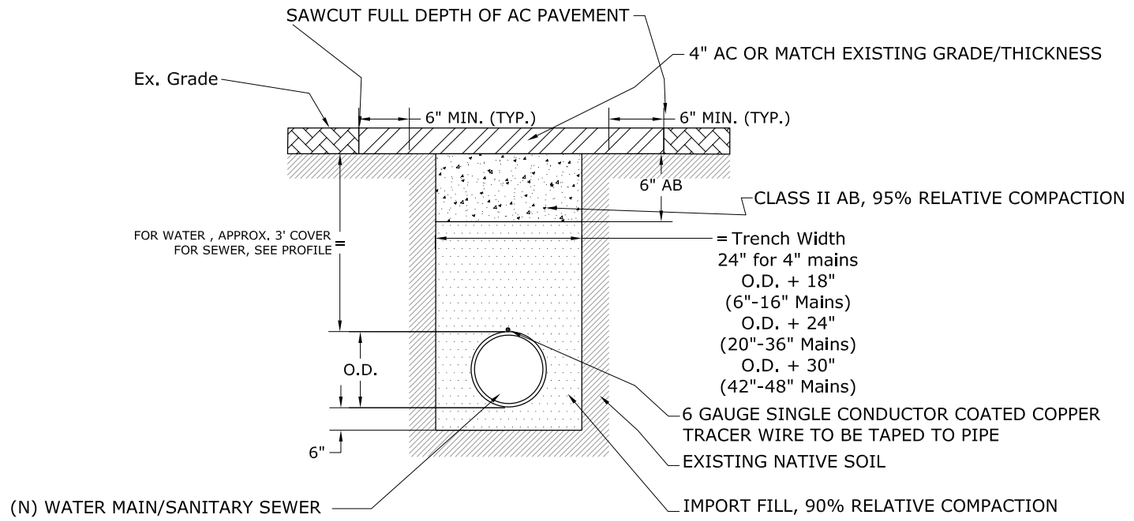
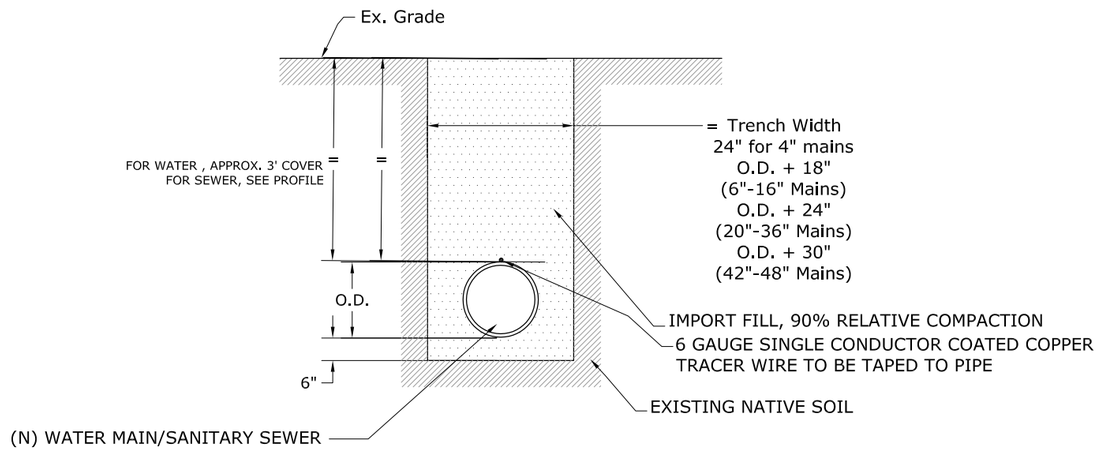
20081016.1326




## EXISTING PAVED AREAS




## NON-PAVED AREAS

UTILITY TRENCH DETAIL A

N.T.S. C-118

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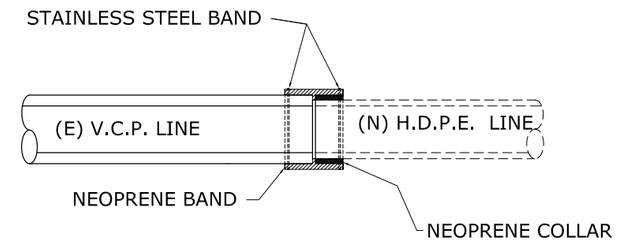
SHEET TITLE

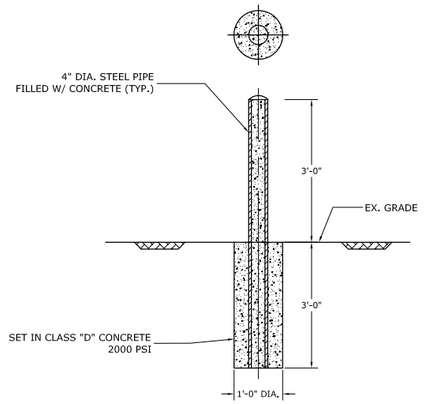
**SECTIONS AND DETAILS**

**C-504**

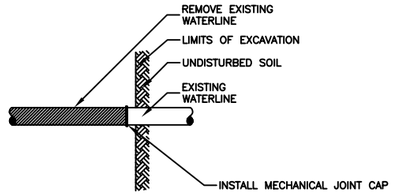
SHEET 31 OF 33




V.C.P. TO H.D.P.E. CONNECTION DETAIL — 1 / C-118 — N.T.S.




BOLLARD DETAIL — 2 / C-111 — N.T.S.

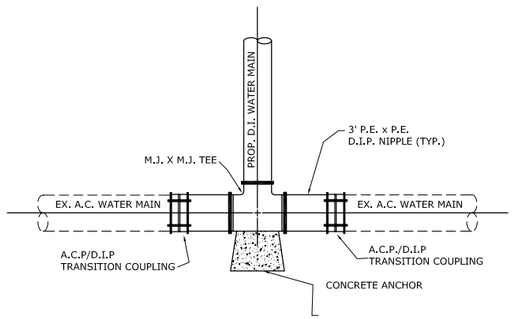



WATERLINE CUT & PLUG — 3 / C-112 — NTS

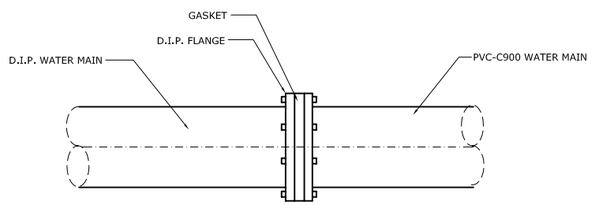
NOTES:

1. FIELD VERIFY LOCATION, DEPTH, AND REQUIRED FITTINGS AT CUT AND CAP LOCATIONS BY POT HOLING BEFORE CONSTRUCTION.

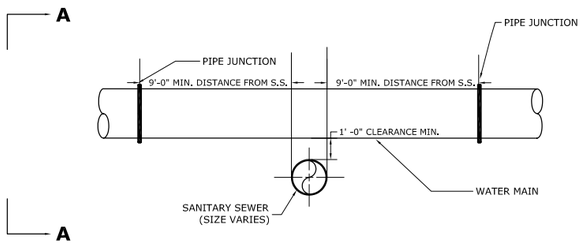
2. REMOVE ALL SURFACE FEATURES ASSOCIATED WITH REMOVED WATERLINES.



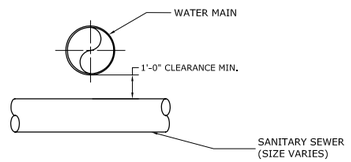

A.C.P TO PVC/D.I.P DETAIL — 4 / C-112 — N.T.S.




PVC / D.I.P. – FLANGE ADAPTER DETAIL — 5 / C-112 — N.T.S.




**ELEVATION**




**SECTION A-A**

WATER MAIN CROSSING OVER SANITARY SEWER — 6 / – — N.T.S.

DRAWING REDUCED
REFER TO GRAPHIC SCALE

MACTEC
ENGINEERING & CONSULTING, INC.
28 Second Street, Suite 700
San Francisco, California 94105
(415) 543-8422

REGISTERED PROFESSIONAL ENGINEER — RAMA S. HOMAYOUNI — 051467 — EXP: 06/30/09 — CIVIL — STATE OF CALIFORNIA

**BUILDING 207/231 REMEDIATION**

OWNER
PRESIDIO TRUST
34 GRAHAM STREET
P.O. BOX 29052
SAN FRANCISCO, CALIFORNIA
(415) 561 - 5300

| NO. | DATE | DESCRIPTION |
|---|---|---|
| | | |
| | | |
| 4 | 10/2008 | FINAL |
| 3 | 7/2008 | REVISED DRAFT |
| 2 | 2/2008 | REVISED DRAFT |
| 1 | 11/2007 | REVISED DRAFT |

PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106066.DWG
DRAWN/DESIGN BY: J. HANZEL-DURBIN
CHECKED BY: R .RAO

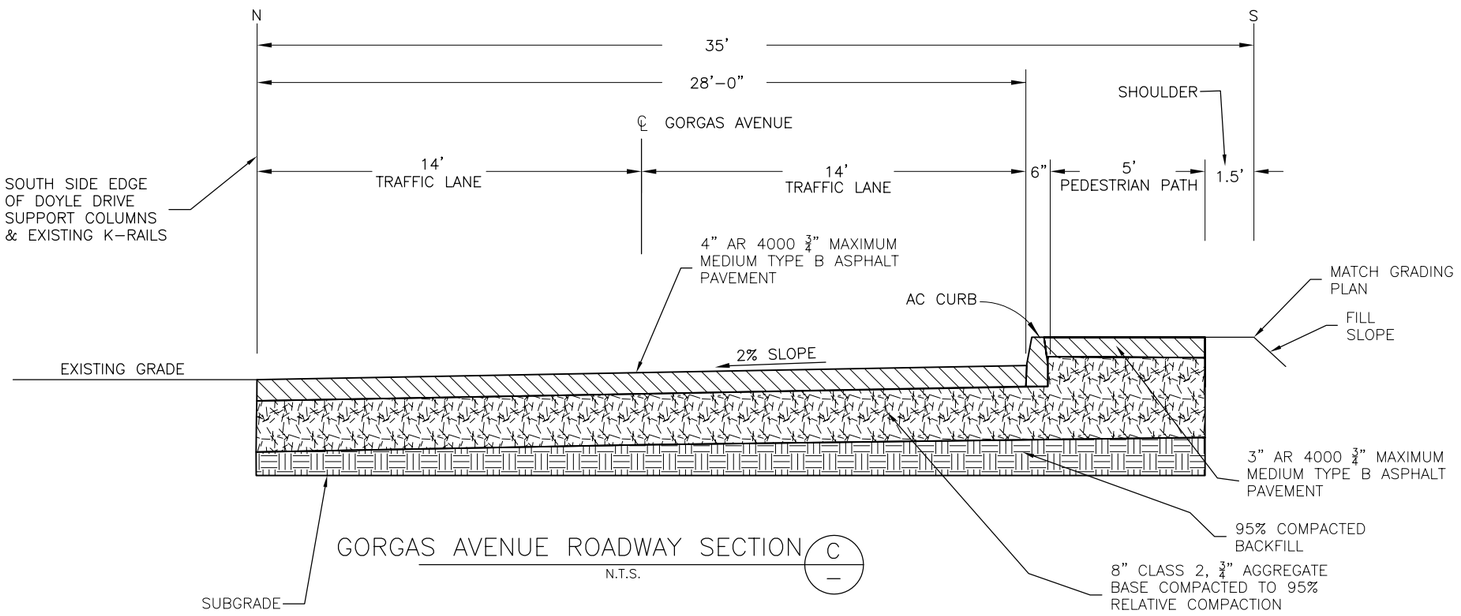


SHEET TITLE

**SECTIONS AND DETAILS**

**C-505**

SHEET 32 OF 33




GORGAS AVENUE ROADWAY SECTION C
N.T.S.

NOTES:

1. The curb ramp shall be outlined, as shown, with a 1'-0" wide border with ¼" grooves approximately ¾" on center. See grooving detail.

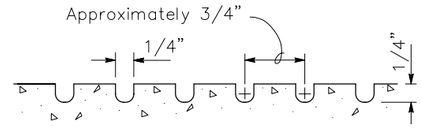
2. Transitions from ramps and landing to walks, gutters or streets shall be flush and free of abrupt changes.

3. Maximum slopes of adjoining gutters, the road surface immediately adjacent to the curb ramp or accessible route shall not exceed 5 percent within 4'-0" of the top and bottom of the curb ramp.

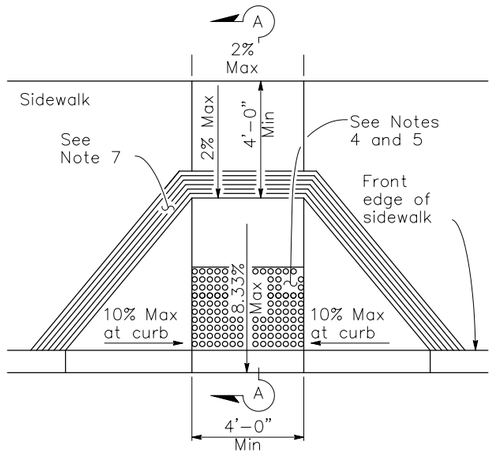
4. Curb ramps shall have a detectable warning surface that extends the full width and 3'-0" depth of the ramp. Detectable Warning Surfaces shall be provided by the manufacturer Armor-tile or equivalent, (Federal Yellow Color No. 33538) and will conform to the details on this plan and the requirements in the Special Provisions.

5. The edge of the detectable warning surface nearest the street shall be between 6" and 8" from the gutter flowline.

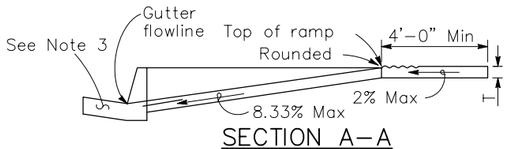
6. Sidewalk and ramp thickness, "T", shall be 3½" minimum.




GROOVING DETAIL

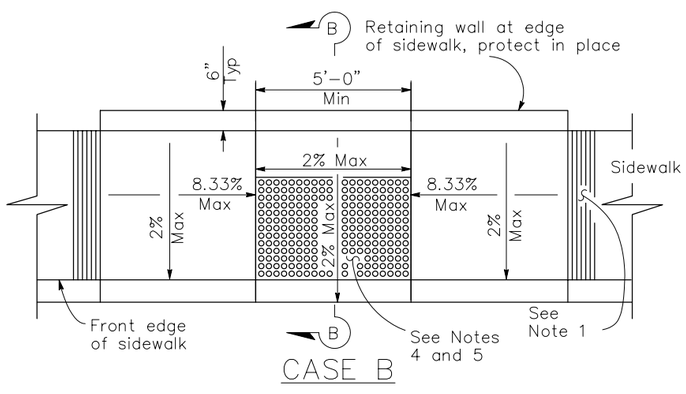



CASE A

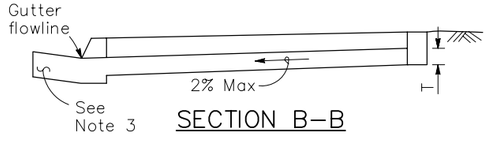



SECTION A-A

PEDESTRIAN CONC RAMP DETAIL 2/C121
N.T.S.

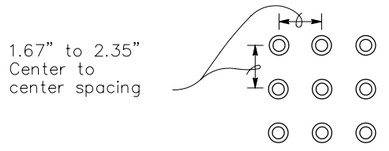



CASE B

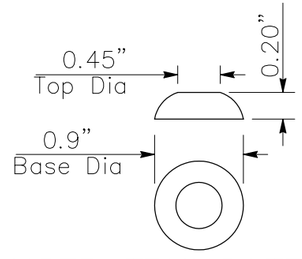



SECTION B-B

PEDESTRIAN CONC RAMP DETAIL 3/C121
N.T.S.




RAISED TRUNCATED DOME PATTERN (IN-LINE)
DETECTABLE WARNING SURFACE




RAISED TRUNCATED DOME

DRAWING REDUCED
REFER TO GRAPHIC SCALE

MACTEC
ENGINEERING & CONSULTING, INC.
28 Second Street, Suite 700
San Francisco, California 94105
(415) 543-8422

**BUILDING 207/231 REMEDIATION**

OWNER
PRESIDIO TRUST
34 GRAHAM STREET
P.O. BOX 29052
SAN FRANCISCO, CALIFORNIA
(415) 561 - 5300

| NO. | DATE | DESCRIPTION |
|---|---|---|
| 4 | 10/2008 | FINAL |
| 3 | 7/2008 | REVISED DRAFT |
| 2 | 2/2008 | REVISED DRAFT |
| 1 | 11/2007 | REVISED DRAFT |

PROJECT NO: 4084075106 07
CAD DWG FILE: 4084075106050.DWG
DRAWN/DESIGN BY: J HANZEL-DURBIN
CHECKED BY: R .RAO



SHEET TITLE

**SECTIONS AND DETAILS**

**C-506**
SHEET 33 OF 33

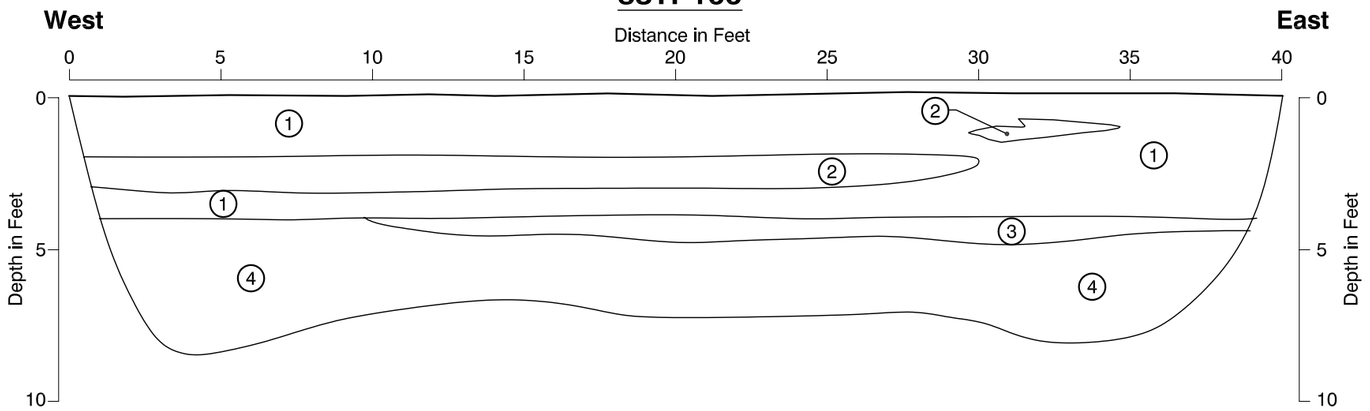
ATTACHMENT 1

GEOARCHAEOLOGICAL TRENCH LOGS (*MACTEC, 2006B*)

A-1: TRENCH 38TP100 & 38TP101
A-2: TRENCH 207TP100 & 207TP101
A-3: TRENCH 230TP100
A-4: TRENCH 231TP100 & 231TP101
A-5: TRENCH 231TP102 & 231TP103

REVIEWED BY: RR
APPROVED BY: MS

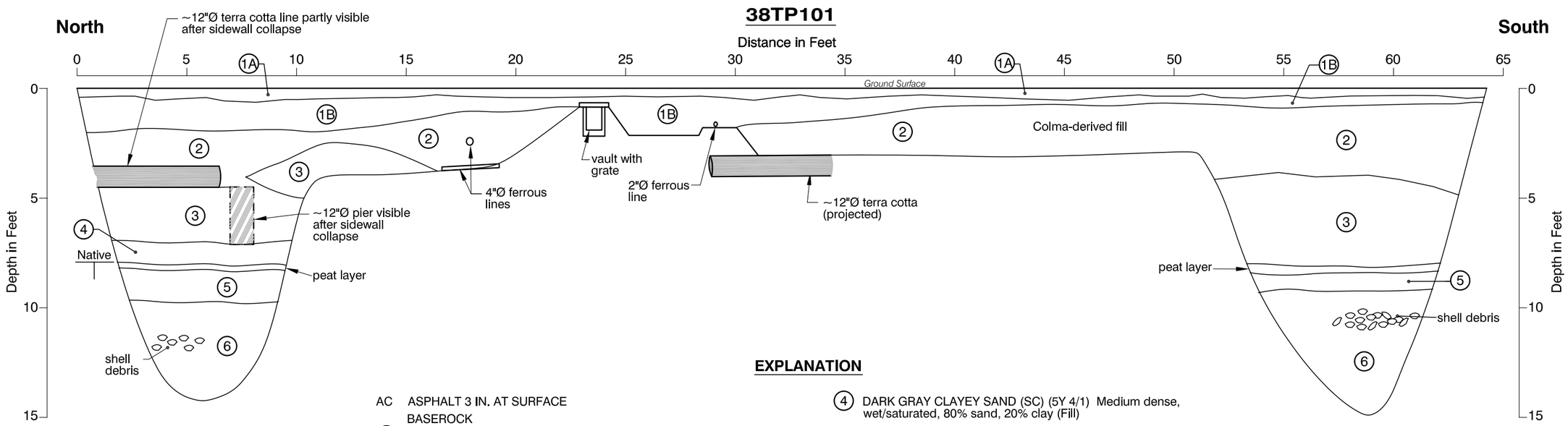
## 38TP100




### EXPLANATION

1. LIGHT OLIVE-BROWN POORLY-GRADED SAND (SP) (2.5Y 5/3) Loose, moist, 95% sand (fine to medium), 5% silt, some terra cotta pipe fragments, shell hash (Fill)
2. OLIVE-BROWN POORLY-GRADED GRAVEL (GP) (2.5Y 4/3) Loose, wet, 90% gravel (3/4 - 1.5 in. dia), 10% sand (Fill)
3. BLACK SANDY SILT (ML) (2.5Y N2/0) Firm to hard, moist, 70% silt/clay, 30% very fine sand with root fibers and organic material in places. Has light gray fat clay on top surface. Fat clay is 1/2 - 2 in. thick. Silt lies evenly on sand below, doesn't look like a natural contact (compacted, re-worked Native/Fill)
4. DARK GRAY POORLY-GRADED SAND (SP) (5Y 4/1) Loose to medium dense, moist to wet, 95% fine to medium sand, 5% silt/files, massive, no bedding structures (Native)

## 38TP101




### EXPLANATION

AC ASPHALT 3 IN. AT SURFACE

BASEROCK

1A RED CHERT TOP 1 ft. and

1B MIXED FRANCISCAN (1 in. MINUS) in second foot

2. DARK YELLOWISH BROWN SANDY LEAN CLAY (CL) (10YR 4/4) Medium firm, moist, 60% clay, 40% sand (Colma-derived fill), some color variation
3. DARK GRAY SANDY CLAY/CLAYEY SAND (CL/SC) Textural variations to fill, bay origin, disturbed
4. DARK GRAY CLAYEY SAND (SC) (5Y 4/1) Medium dense, wet/saturated, 80% sand, 20% clay (Fill)
5. GRAY FAT CLAY (CH) (5Y 5/1) Soft, wet, 90% clay, 10% organics (Native)
6. DARK GRAY POORLY-GRADED SAND (SP) (5Y 4/1) Medium dense, wet, 90% sand, 10% clay, some clayey sand layers and shell layers in unit; higher clay content at top of unit; no staining or signs of contamination (Native)

4089041001049.DWG 1.0
20060414.1254

PLATE

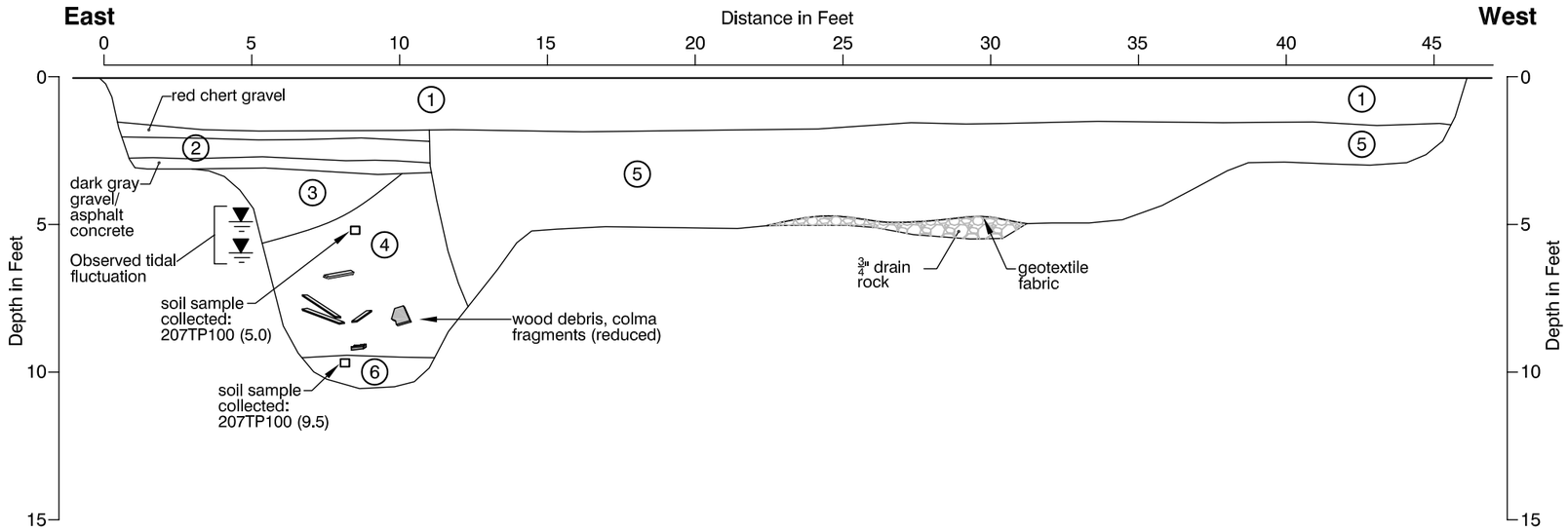
**Logs of Test Pits 38TP100 and 38TP101**

**A-1**

MACTEC

| DRAWN | JOB NUMBER | CHECKED | CHCK'D DATE | APPROVED | APPRV'D DATE |
|---|---|---|---|---|---|
| CN | 4089041001 109 | | 03/06 | | |

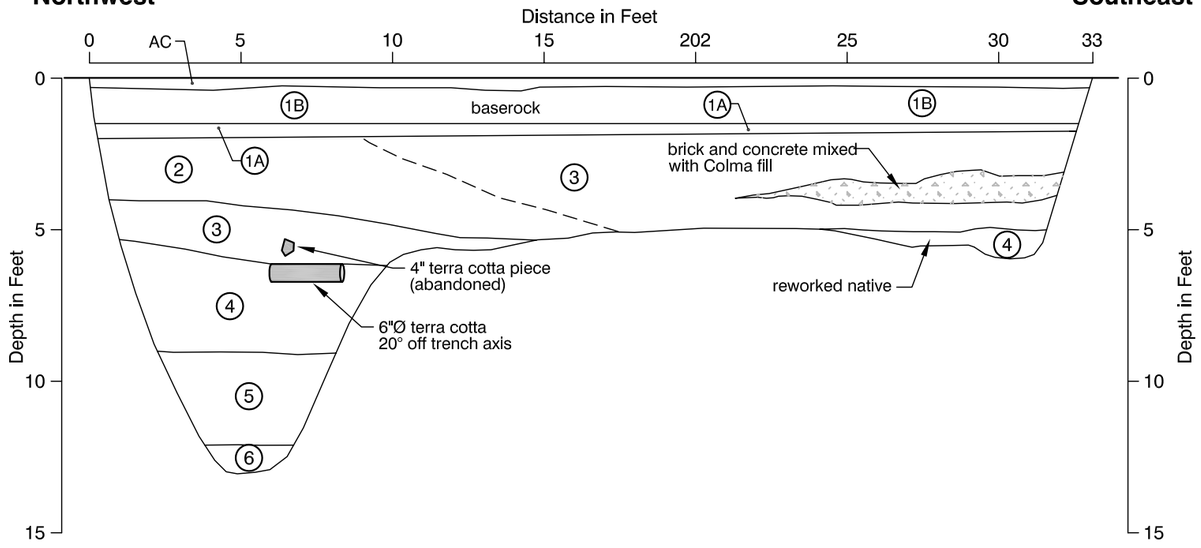
## 207TP100




### EXPLANATION

1. OLIVE-BROWN POORLY-GRADED SAND (SP) (2.5Y 4/3) Loose, moist to wet, 90% fine to medium sand, 5% fines, 5% gravel inclusions, brick debris, asphalt
2. DARK YELLOWISH BROWN CLAY WITH SAND (CL) (10YR 4/4) Medium firm, moist, 75-85% clay/fines, 15-25% sand (Colma derived Fill)
3. DARK OLIVE-GRAY POORLY-GRADED SAND (SP) (5Y 3/4) Loose, moist, 95% medium sand, 5% shell hash, with inclusions of clay
4. DARK GRAY POORLY-GRADED SAND (SP) (5Y 4/1) Loose, wet to saturated, 90% sand, 10% clay/fines, with abundant wood debris, slight TPH odor (1 ppm) (Fill)
5. DARK BROWN CLAYEY SAND 9SC) (10YR 3/3) Loose to medium dense, wet, 85-90% sand, 10-15% clay/fines (excavation backfill) with minor amounts of brick, porcelain
6. DARK GRAY POORLY-GRADED SAND (SP) (5Y 4/1) Medium dense, saturated, 100% fine to medium sand

## 207TP101




### EXPLANATION

AC ASPHALT 3 IN. AT SURFACE

BASEROCK

1A RED CHERT layer, no fines, wet

1B BROWN WELL-GRADED GRAVEL WITH SAND (GW) (10YR 4/3) Medium dense to dense, moist, 70% gravel, 25% sand, 5% fines (Baserock)

2. DARK YELLOWISH BROWN POORLY-GRADED SAND/SILTY SAND (textural variations) (SP/SM) (10YR 4/4) Loose, moist, 80-95% sand, 5-20% silt/fines, with inclusions/layers/fill events of gravel and clay, including brick and wood (Fill)
3. BROWN WELL-GRADED GRAVEL WITH SAND (textural variations throughout) (GW) (10YR 5/3) Loose to medium dense, moist to wet, generally 60% gravel, 30% sand, 10% fines, some brick, refuse (GravellyFill)
4. DARK GRAY CLAYEY SAND (SC) (5Y 4/1) Medium dense, moist to wet, generally 80% sand, 20% clay/fines. Some intact clam shells to ~2" length, heterogeneous texture (reworked Native)
5. DARK GRAY FAT CLAY (CH)(5Y 4/1) Soft, wet, 90% clay, 10% organics/sand (Bay Mud - Native)
6. DARK GRAY POORLY-GRADED SAND (SP)(5Y 4/1) Loose, wet, 90-95% sand, 5-10% clay/fines

4089041001053.DWG 0.0
20060414.1236

MACTEC

**Logs of Test Pits 207TP100 and 207TP101**

PLATE

**A-2**

| DRAWN | JOB NUMBER | CHECKED | CHCK'D DATE | APPROVED | APPRV'D DATE |
|---|---|---|---|---|---|
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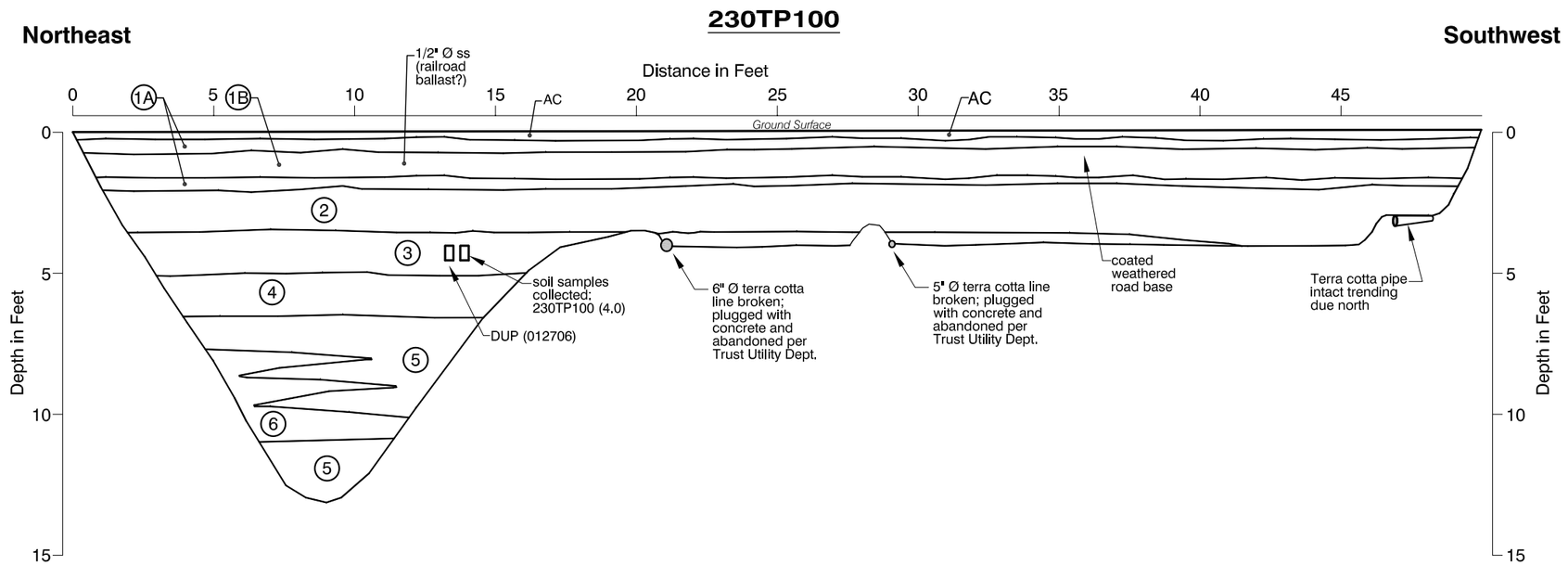



## EXPLANATION

AC ASPHALT AT SURFACE

BASEROCK (Fill))

(1A) RED CHERT GRAVEL

(1B) LIGHT BROWN SANDSTONE GRAVEL, 1-1/2" Ø (similar to railroad ballast)

(2) VERY DARK GRAYISH BROWN SANDY LEAN CLAY (CL) (10YR 3/2) Soft to firm (more compact at surface), moist to wet, 60-80% clay, 20-40% sand, generally sandier at base (Fill)

(3) OLIVE SILTY SAND (SM) (5Y 4/3) Medium dense, moist to wet, 60-80% fine sand, 20-40% silt (Colma-derived fill, appears to be highly reduced)

(4) DARK OLIVE-GRAY CLAYEY SAND (SC) (5Y 3/2) Loose, wet, 60% fine sand, 35% clay/fines, 5% gravel (Fill or disturbed Native)

(5) DARK GRAY POORLY-GRADED SAND (SP) (5Y 4/1) Loose to medium dense, wet, 90% sand, 10% silt/fines, no shell (Native)

(6) DARK GRAY FAT CLAY (CH) (5Y 4/1) Soft, wet, 90% clay, 10% organics, clay forms discontinuous layers within sand (Native)

4089041001049.DWG 1.0
20060421.1015

MACTEC

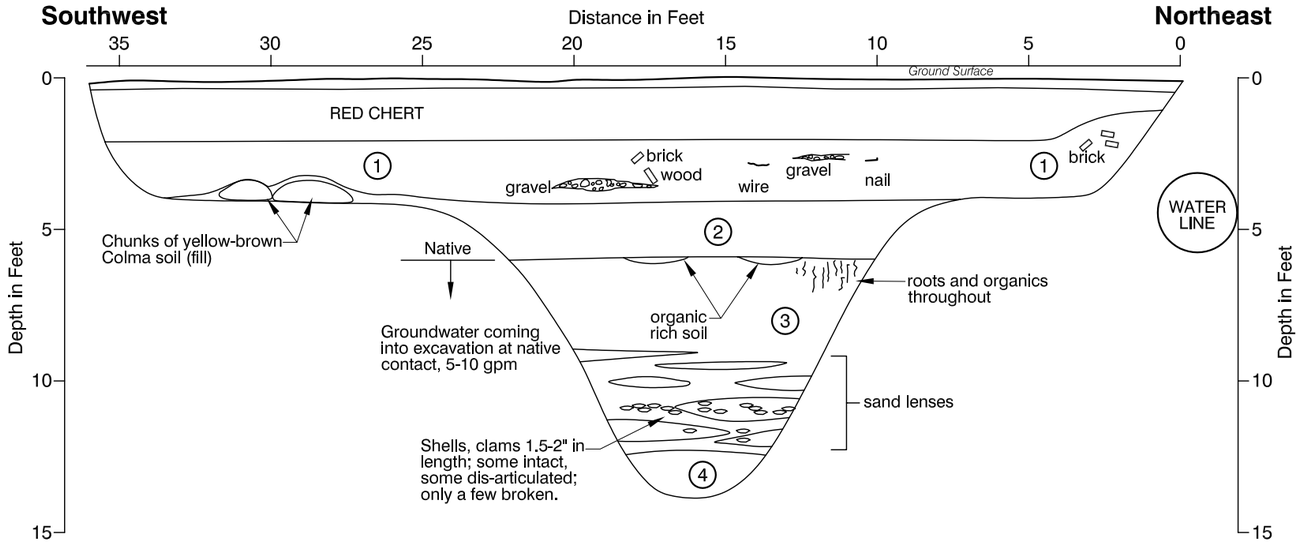
**Log of Test Pit 230TP100**

PLATE

**A-3**

| DRAWN | JOB NUMBER | CHECKED | CHCK'D DATE | APPROVED | APPRV'D DATE |
|---|---|---|---|---|---|
| CN | 4089041001 109 | | 03/06 | | |

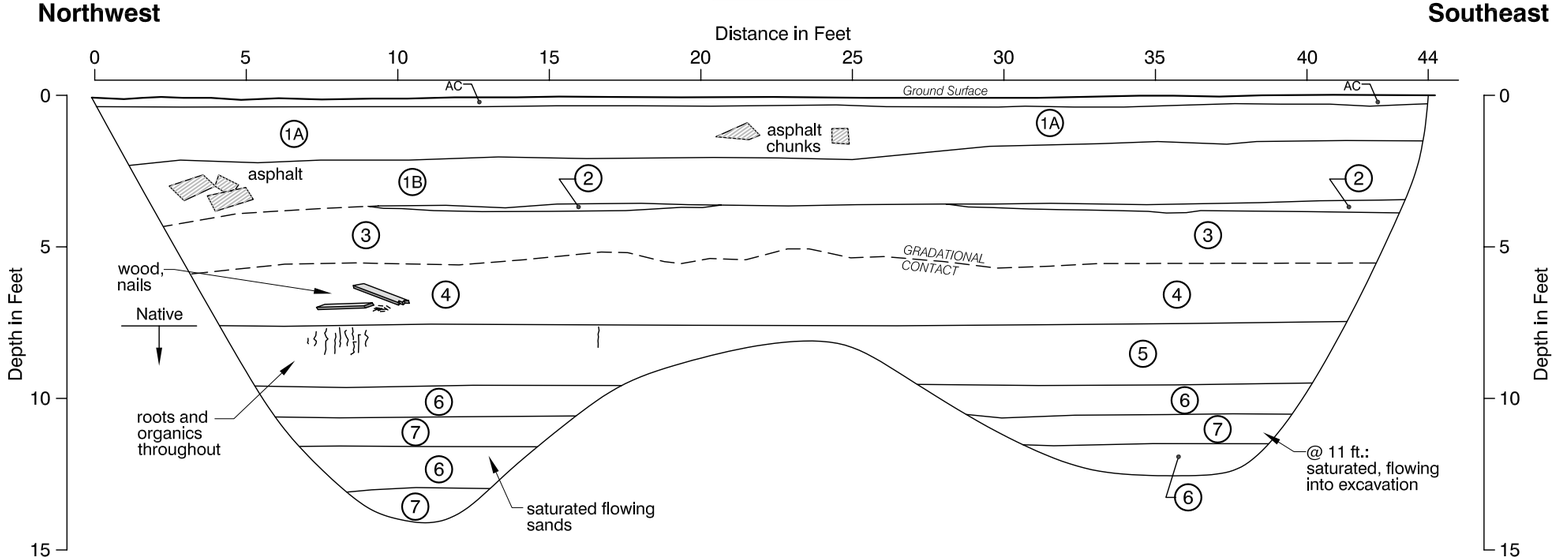
## 231TP100




### EXPLANATION

1. VERY DARK GRAYISH BROWN LEAN CLAY WITH SAND (CL)(10 YR 3/2) Soft to firm (at top), 75% clay, 25% sand with trace debris
2. DARK OLIVE-GRAY CLAYEY SAND (SC)(5 YR 3/2) Medium dense to dense, 60-70% sand, 30-40% clay/fines (Colma-derived fill))
3. OLIVE-GRAY FAT CLAY (CH)(5 YR 5/2) Soft, wet, 80-90% clay, 10-20% organics (most as root structures at top) and sand lenses, which become thicker with depth (Native)
4. DARK GRAY POORLY-GRADED SAND (SP)(5 YR 4/1) Medium dense, wet, 100% fine to medium sand (Native)

## 231TP101




### EXPLANATION

AC ASPHALT 3 IN. AT SURFACE

BASEROCK

1A RED CHERT, little to no fines to 1.5 to 2.0 ft bgs

1B VERY DARK GRAYISH BROWN SANDY LEAN CLAY (CL)(10 YR 3/2) Soft, moist to wet, 70% clay, 30% sand, trace brick, metal

2. YELLOWISH BROWN SANDY LEAN CLAY (CL)(10 YR 5/6) Hard, moist, 60% clay/fines, 40% sand, grades into clay below compacted with white deposit ($CaCO_3$?) on top surface
3. DARK OLIVE-GRAY FAT CLAY (CH)(5 YR 3/2) Soft, moist to wet, 90% clay, 10% sand with inclusions (Fill)
4. DARK OLIVE-GRAY POORLY GRADED SAND (SP)(5 YR 3/2) Loose, wet (flowing at base), 90% sand, 10% fines with wood, nails (Fill)
5. OLIVE-GRAY ORGANIC FAT CLAY (CH)(5 YR 5/2) Soft, wet, 60-70% clay, 30-40% organics, primarily roots (Native), some color variation to very dark grayish brown (10 YR 3/2)
6. DARK GRAY POORLY GRADED SAND (SP)(5 YR 4/1) Medium dense, wet ,100% fine-med sand, trace organics
7. DARK GRAY FAT CLAY (CH)(5 YR 4/1) Soft, wet, 100% clay, trace organics

4089041001052.DWG 0.0
20060421.1431

MACTEC

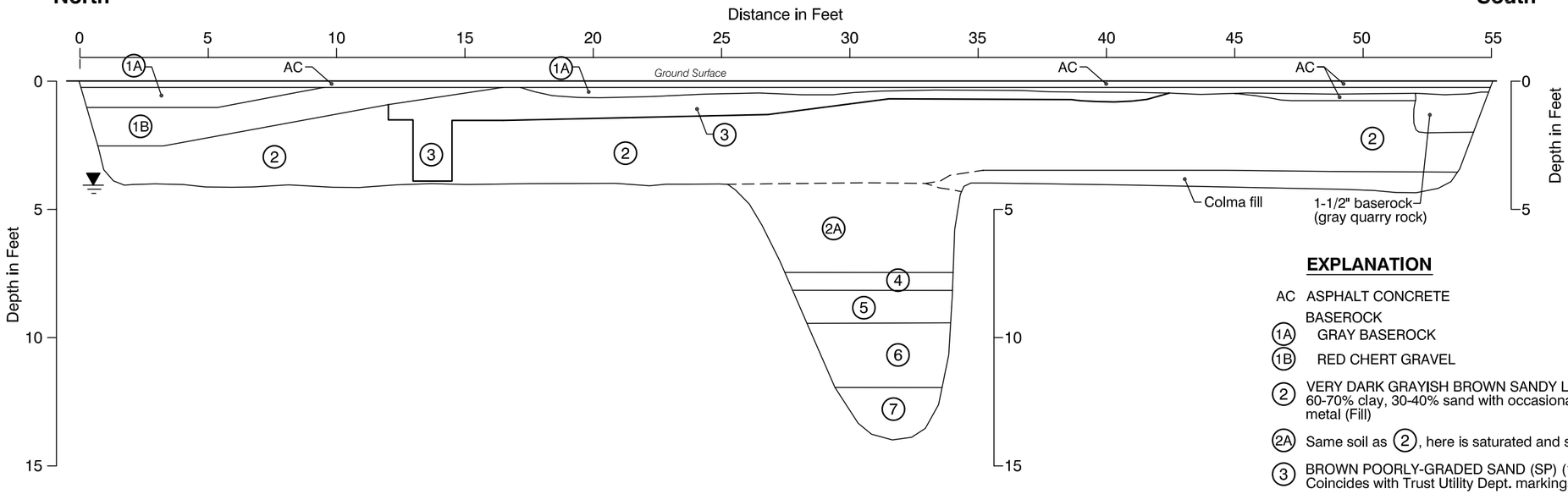
**Logs of Test Pits 231TP100 and 231TP101**

PLATE

**A-4**

| DRAWN | JOB NUMBER | CHECKED | CHCK'D DATE | APPROVED | APPRV'D DATE |
|---|---|---|---|---|---|
| CN | 4089041001 109 | | 03/06 | | |

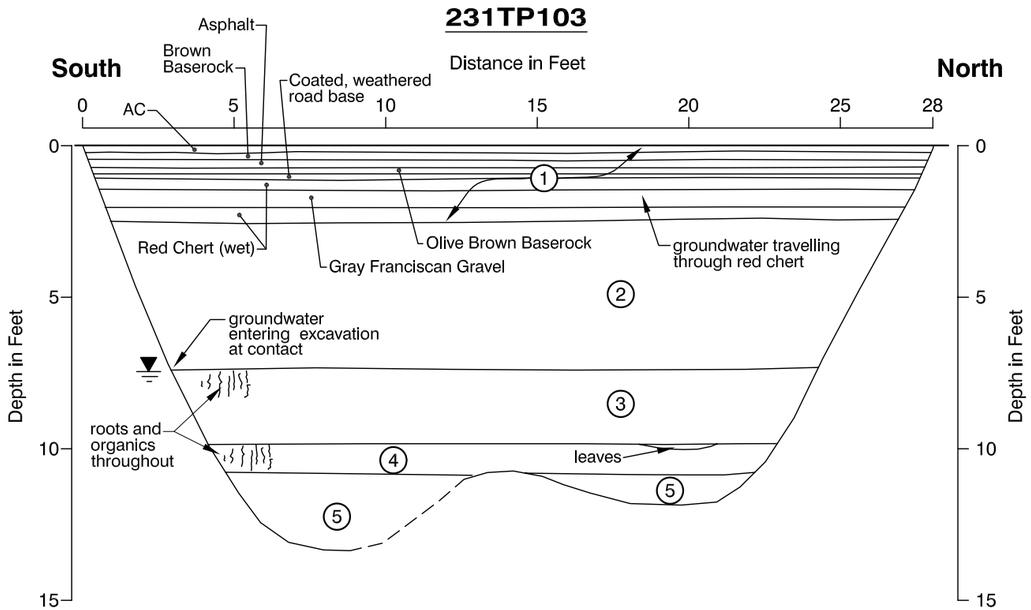
## 231TP102




### EXPLANATION

- AC ASPHALT CONCRETE
- BASEROCK
- (1A) GRAY BASEROCK
- (1B) RED CHERT GRAVEL
- (2) VERY DARK GRAYISH BROWN SANDY LEAN CLAY (CL) (10YR 3/2) Soft to firm, moist to wet, 60-70% clay, 30-40% sand with occasional gravel and sparse debris, including brick, wood, glass, metal (Fill)
- (2A) Same soil as (2), here is saturated and soft (Fill)
- (3) BROWN POORLY-GRADED SAND (SP) (10YR 5/3) Loose, moist, 100% sand (Fill). Coincides with Trust Utility Dept. markings for abandoned sanitary sewer.
- (4) BLACK ORGANIC FAT CLAY (CH) (10YR 2/1) Soft, wet, 60% clay, 30% organics, including leaves and roots (Native)
- (5) GRAY FAT CLAY (CH) (5Y 5/1) Soft, wet, 80% clay, 20% organics (roots, perhaps pickleweed), some thin laminations of sand (Native)
- (6) DARK BLUISH GRAY POORLY-GRADED SAND (SP) (5B 4/1) Loose, saturated, 90% fine to medium sand, 10% fines (Native)
- (7) LIGHT YELLOWISH BROWN POORLY-GRADED SAND (SP)(10YR 6/4) Medium dense, saturated, 90% fine to medium sand, 10% fines with iron oxide banding and soft iron oxide inclusions (Native)

## 231TP103




### EXPLANATION

- AC ASPHALT CONCRETE
- (1) ROAD BASE MATERIAL (GC/GP/GW) - refer to details
- (2) VERY DARK GRAYISH BROWN SANDY LEAN CLAY (CL) (10 YR 3/2) Soft, moist to wet, 70% clay/fines, 30% fine sand; inclusions of grayish clay and clayey sand (Fill)
- (3) OLIVE-GRAY CLAYEY SAND (SC)(2.5 YR 4/2) Firm, wet, 70% fine sand, 30% clay/fines, consistent in color and texture with the top of Colma Formation; has root development, no topsoil horizon, looks disturbed in places (possibly slumps/slope wash)
- (4) DARK BROWN ORGANIC CLAY (CL) (10 YR 3/3) Soft to medium firm, moist, 60% clay/fines, 40% organics, with roots growing through sandy laminations (Native)
- (5) DARK OLIVE-GRAY POORLY GRADED SAND (SP) (5 YR 3/2) Loose, wet (saturated), 95% fine to medium sand, 5% fines, trace organics, no stratigraphy, massive (possibly dune sand - Native)

4089041001052.DWG 1.0
20060310.0848

MACTEC

**Logs of Test Pits 231TP102 and 231TP103**

PLATE **A-5**

| DRAWN | JOB NUMBER | CHECKED | CHCK'D DATE | APPROVED | APPRV'D DATE |
|---|---|---|---|---|---|
| CN | 4089041001 109 | | 03/06 | | |

ATTACHMENT 2

NATURAL SAND SPECIFICATIONS

REVIEWED BY: RR

**Graniterock**
350 Technology Drive; Watsonville, CA 95076

Baldrige Award Winner
Research-Technical Services Ph. (831) 768-2330
FAX (831) 768-2403

## Quail Hollow Material Certification
## Felton, CA

**Product: Quail Hollow Utility/Trench Sand (#271)** **Date: February 26, 2007**

**Contractor: Geomatrix**

**Project: Presidio, San Francisco**

Graniterock conducts regular sampling and testing of its materials, in accordance with ASTM or other applicable standards. The results listed below are average results derived from these tests. Based on the testing conducted, Graniterock certifies that the material identified on this certificate typically has the following physical properties and satisfies the requirements of the specification shown below.

**Gradation : Cumulative Percent Passing**

| Sieve Size | Typical Utility Sand Spec. | Quail Hollow Utility Sand |
|---|---|---|
| ½" | 100 | 100 |
| #4 (4.75 mm) | 75-100 | 100 |
| #8 (2.36 mm) | 70-100 | 99 |
| #16 (1.18 mm) | 65-100 | 96 |
| #30 (600 um) | 60-100 | 87 |
| #50 (300 um) | 40-70 | 57 |
| #100(150 um) | 0-30 | 12 |
| #200( 75 um) | 0-15 | 4 |

e.g. for use for 911 backfill, except subgrade for pavement.

| | | |
|---|---|---|
| Organic Impurities: | No darker than Plate 3 | Lighter than Plate 3 |
| Sand Equivalent: | Equal to or > 20 | 70 |
| pH | =or > 4.5 but < 9 | 7.8 |
| Chloride Content | < or = 500 ppm | 2.2 |
| Sulfate Content | = or < 150) | |

Submitted by:

Greg Wilkinson / Research Technical Services

ATTACHMENT 3

PRESIDIO TRUST'S SANITARY SEWER MANAGEMENT PLAN

REVIEWED BY: RR

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# Sewer System Management Plan (SSMP)

## PLAN OVERVIEW

The 1,491-acre Presidio of San Francisco (Presidio) possesses an extraordinary combination of ecological diversity, inherent beauty, and historical significance. Under the 1996 Trust Act, Congress created a new federal agency, the Presidio Trust (Trust), to preserve and enhance the cultural, natural, scenic, and recreational resources of the Presidio for public use while ensuring the park becomes financially self-sufficient with respect to both annual operations and long-term needs.

A military garrison since 1776, the Presidio was designated a National Historic Landmark District (NHLD) in 1962. The Presidio's 770 buildings total approximately 6.1 million square feet and include an array of offices, warehouses, workshops, and residences. Residential structures include large single-family homes and duplexes, as well as apartment complexes and barracks. The Presidio has facilities and amenities that serve residents, park visitors, and non-residential tenants. The Presidio has its own electric distribution, telecommunication, refuse collection, water, storm drain, and wastewater collection systems.

The storm and sanitary sewer collection systems are two separate systems at the Presidio. The sanitary sewer system is comprised of approximately 50 miles of sewer lines, over 800 building service connections, 7 sewage-lift pumping stations, and nearly 700 manholes. Raw waste water is collected from Presidio buildings and discharged into the City and County of San Francisco's sanitary sewer system at one of five locations along the park's border with the City. The City and Trust meter the amount of wastewater discharged to the City and the Trust pays the City for treatment services based on total volume discharged.

Over the years, the amount of wastewater discharged to the City has decreased substantially. Before leaving the Presidio in 1994, the Army implemented a major infrastructure repair program which included slip-lining of main and lateral sanitary sewer lines with high density polyethylene (HDPE) pipe which reduced the potential for infiltration of storm water into the sanitary system. The remaining pipes are vitrified clay pipe (VCP) with cement and mortar joints.

During 2000 and 2001, the Trust conducted surveys of the Presidio sanitary sewer system. Several areas requiring immediate repair were identified and those repairs have been implemented. The Trust has continued with an active maintenance program and has experienced relatively few line stoppages. Roots and household debris cause the vast majority of the stoppages. Almost all of the sewer system overflows (SSOs) have been less than 100 gallons and there have

been no recorded overflows of greater than 1,000 gallons to waters of the United States since the Trust began record keeping in 1999.

# Sewer System Management Plan (SSMP)

## PLAN ELEMENTS

### 1. Goals

Requirement: Each wastewater collection agency shall, at a minimum, shall develop goals for the Sewer System Management Plan as follows:

- To properly manage, operate, and maintain all parts of the wastewater collection system
- To provide adequate capacity to convey peak flows
- To minimize the frequency of SSOs
- To mitigate the impact of SSOs

This section is applicable to all wastewater collection systems.

The Trust recognizes the importance of protecting Bay Area water quality by preventing sewer spills and is supplementing its existing procedures with the Clean Water Act requirements of the new regulations. The goals of the Trust SSMP are:

- To properly manage, operate, and maintain all parts of the wastewater collection system
- To provide adequate capacity to convey peak flows
- To minimize the frequency of SSOs
- To mitigate the impact of SSOs
- To provide consistent, reliable service to our customers

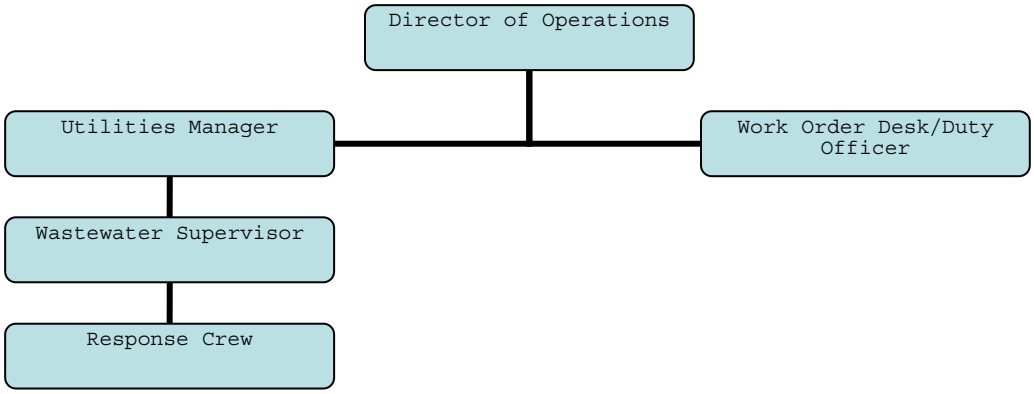
## 2. Organization

Requirement: Each wastewater collection agency shall, at a minimum, provide information regarding organization:

- Identify agency staff responsible for implementing, managing, and updating the SSMP
- Identify chain of communication for responding to SSOs
- Identify chain of communication for reporting SSOs

This section is applicable to all wastewater collection systems.

The following organizational chart shows the lines of authority of the administrative and field staff responsible for responding to an SSO.




The responsibilities of each staff position are briefly described below:

**Director of Operations** - Establishes policy, plans strategy, allocates resources, delegates responsibility (as appropriate), and leads members of the Real Estate, Design & Construction Services, Environmental Remediation, and Operations staff, to include the Utilities office.

**Utilities Manager** - Leads staff in overall SSMP implementation, authorizes outside contractors to perform services as needed, acts as liaison to Trust Public Affairs and provides reports to the Director of Operations as needed.

**Work Order Desk/Duty Officer** – Receives reports of possible SSOs from a variety of sources such as the Presidio tenants, staff, neighbors, and the general public. All such reports are received by the Work Order Desk during business hours and the Duty Officer during non-business hours. Reports are then relayed to the Wastewater Supervisor or his designee who investigates and determines what actions need to be taken.

**Wastewater Supervisor (the 'Supervisor')** - Implements, manages, and updates the SSMP as well as maintenance and operating plans for the Department. Manages field operations and maintenance activities, coordinates response to SSOs, and handles all required spill reporting.

**Field Crew** - Implements emergency response as directed by the Supervisor.

### 3. Overflow Emergency Response Plan

Requirement: Each wastewater collection system agency shall develop an overflow emergency response plan with the following elements:

- Notification- Provide SSO notification procedures.
- Response- Develop and implement a plan to respond to SSOs.
- Reporting- Develop procedures to report and notify SSOs per Monitoring and Reporting Program.
- Impact Mitigation- Develop steps to contain wastewater, to prevent overflows from reaching surface waters, and to minimize or correct any adverse impact from SSOs.

This section is applicable to all wastewater collection systems.

**Overflow Emergency Response Plan:**

**Purpose:**
The Trust has structured this Sanitary Sewer Overflow Response Plan to satisfy the requirements of the SSMP Development Guide distributed by the California Regional Water Quality Control Board, Bay Area Region.

**General:**
The Sanitary Sewer Overflow Response Plan (SSORP) defines appropriate actions to be taken by the Trust upon notification of a possible sanitary sewer overflow within the Presidio. The Trust shall dispatch the appropriate crews to investigate the possible overflow, identify the cause, and take corrective steps to minimize the effects of the overflow on public health and the quality of surface waters. The SSORP further includes provisions to ensure that notification and reporting are made to the appropriate local and state agencies.

**Objectives:**
The primary objectives of the SSORP are to:

- Protect public health and the environment
- Satisfy the requirements of regulatory agencies which have authority over management of sanitary sewer overflows.
- Provide appropriate customer service, protect the wastewater collection systems including all related appurtenances and personnel, and protect property from overflows.

**Notification Procedure to the Water Board**:
The Trust will notify and inform the Bay Area Water Quality Control Board (Water Board) as soon as possible and keep them abreast of response actions and final corrective actions on any SSO that flows into "Waters of the United States" that reaches the reporting threshold.

**Overflow Response Procedure:**
The Sanitary Sewer Overflow Response Procedure presents a strategy for the Trust to mobilize labor, materials, tools, and equipment to correct or repair any condition, which may cause or contribute to an un-permitted discharge from the Trust sanitary sewer system. A wide range of potential system failures are considered by the plan. Responding to system failures will lessen the effect of overflows to both surface waters and land.

**Discovery of SSO and Internal Coordination Within The Trust:**
The Trust maintains a Work Order Desk which receives all routine and urgent reports of maintenance concerns in the Park during normal business hours. During non-working hours, this function is served by the Duty Officer Program so that reports of maintenance needs are received 24/7/365. Reports of possible SSOs can be made by Trust staff, Presidio tenants, and/or the general public to either the Work Order Desk or the Duty Officer. If the person making the report is unfamiliar with the Work Order System, they can contact the Park Police, Fire Department, or any other official who will then relay the information to the appropriate party.

Once notice of a possible SSO and its location are received by the Work Order Desk or Duty Officer they immediately contact the Trust Wastewater Supervisor (see Organization Chart in Section 2), or his designee, who will investigate and take appropriate action.

**Response:**
If a report of an SSO is received during regular working hours, Work Order Desk personnel will contact the Wastewater Supervisor who will go to the site and take appropriate action as described below.

If the report is received during non-working hours, the Duty Officer will notify an on-call Collections System staff who will visit the site and contact the Supervisor. Together the Collections System staff and the Supervisor will then determine the appropriate plan of action as described below.

At a minimum, all Trust responses will include the following steps:

1. Stop the SSO at its source. This may involve use of specialized equipment such as a jetter to clear clogged pipes or a backhoe/loader. The On-Call Program shall include personnel trained in the use of appropriate equipment to handle SSOs.
2. Contain the spill as needed, generally using:
    a. Sandbags
    b. Silt Fences
    c. Straw Wattles
    d. Earth
    e. Other materials as needed

    If spilled effluent is entering into a storm drain, the storm drain will be blocked immediately.
3. Remove all surface contamination and clean the site as required to mitigate all negative impacts. This may involve use of specialized equipment such as a vactor truck.

**Reporting:**

**The Regulatory Agency Notification Plan** establishes procedures that the Trust shall follow to provide formal notice to the Bay Area Clean Water Agencies ('BACWA') as necessary in the event of a reportable SSO as specified by the table below.

Notification will be by entry into the password-protected BACWA online database (https://www.r2esmr.net/sso_login2.asp) according to the following schedule:

| SSO Reporting Schedule | |
|---|---|
| 1,000 Gals or Greater, Reaching Waters of the U.S. | Report to BACWA Within 24 Hrs. |
| Less Than 1,000 Gals, Reaching Waters of the U.S. | Report to BACWA Within 10 Days |
| Spill Does Not Reach Waters of the U.S. | Internal Reporting Only |

**Impact Mitigation:**

Wastewater Containment - If the volume of the SSO is 1,500 gallons or less, it can be picked up in one load by the vactor truck. If the SSO is larger it will be temporarily contained with straw wattles and/or silt fence and picked up by the vactor truck making successive trips to the nearest functioning sanitary sewer.

Impervious Surfaces – SSOs on impervious surfaces shall be contained and picked up as described above. The affected surface will then be flushed with clean water which will also be contained and removed.

Pervious Surfaces – Once the effluent is removed, the Supervisor will consult with the Trust Environmental Remediation Department and follow their recommendations. In small SSO events, the affected soil may be removed and disposed of off-site in accordance with applicable regulations. If removal is not recommended, the affected area may be sprayed with liquid disinfectant and/or clean soil may be placed over the spill location.

Protection of Surface Waters – The SSO is first contained as described above. If necessary nearby storm drains which could be reached by the effluent are blocked to prevent surface water contamination.

**MAINTENANCE OF SSORP**

The SSORP will be reviewed annually and revised as needed to reflect changes in policies and procedures.

## 4. Fats, Oils and Grease (FOG) Control Program

Requirement: Each wastewater collection system agency shall evaluate its service area to determine whether a FOG control program is needed. If so, a FOG control program shall be developed as part of the SSMP. If an agency determines that a FOG program is not needed, the agency must provide justification for why it is not needed.

This section is applicable to all wastewater collection systems.

All tenants with commercial kitchens are required, under the terms of their lease, to install and maintain proper grease traps. Only small accumulations of grease have been found in the Sanitary Sewer System and grease has not been identified as a significant cause of blockages.

Given these conditions, development of a FOG Control Program is not warranted at this time. However, grease may become a problem as the number of restaurants in the Presidio increases. The Trust will re-evaluate this requirement during the annual audit of the SSMP.

## 5. Legal Authority

Requirement: Each wastewater collection system agency shall, at a minimum, describe its legal authority, through sewer use ordinances, service agreements, or other legally binding procedures to:

- Control infiltration/inflow (I/I) from satellite wastewater collection systems and laterals.
- Require proper design and construction of new and rehabilitated sewers and connections
- Require proper installation, testing, and inspection of new and rehabilitated sewers

This section can be waived for collection systems that serve a population of 10,000 or less.

**Control infiltration and connections from inflow sources, including satellite systems and their connections from private systems:**

The Presidio Trust Act (16 U.S.C. §§ 460bb appendix) grants the Presidio Trust the authority to enact rules and regulations for the use and management of property under the Trust's jurisdiction to include rules and regulations governing the prohibition of private sewer systems and requiring that all occupied property be connected to the Presidio Trust sewer system.

**Require that sewers and connections be properly designed and constructed:**

The Presidio Trust references the "Standard Plans for Public Works Construction" (The Green Book) promulgated by the American Public Works Association (APWA) to insure proper design and construction of sewer facilities.

**Ensure proper installation, testing, and inspection of new and rehabilitated sewers (such as new or rehabilitated collector sewers and new or rehabilitated service laterals):**

The Presidio Trust Wastewater Collection Supervisor oversees inspections of all rehabilitated or newly installed sewer lines to insure compliance with Presidio Trust Standards and Practices. The Inspector maintains a copy of the APWA "Green Book" on the jobsite at all times during inspection visits. The Presidio Trust uses video inspection cameras to help insure proper installation and operation of all lines rehabilitated or newly installed.

## 6. Measures and Activities

### a. Collection System Map

Requirement: Each wastewater collection system agency shall maintain up-to-date maps of its wastewater collection system facilities.

This section is applicable to all wastewater collection systems.

Current maps of the system are maintained by the Trust and reductions are carried by the Response Crew. The maps are updated periodically as changes are made and more accurate information is developed.

### b. Resources and Budget

Requirement: Each wastewater collection system agency shall allocate adequate resources for the operation, maintenance, and repair of its collection system.

This section is applicable to all wastewater collection systems.

The Trust currently funds the wastewater operation and maintenance expenses and capital improvements through the Trust's general fund. The Trust recently completed an overall strategy for managing all of the Presidio's utility and infrastructure systems which will establish funding levels for the wastewater system. This analysis also provides a basis for updating sewer rates for Presidio tenants.

### c. Prioritized Preventive Maintenance

Requirement: Each wastewater collection system agency shall prioritize its preventive maintenance activities.

This section is applicable to all wastewater collection systems.

The Presidio Trust uses its inspection and maintenance records to prioritize preventive maintenance operations. Toward that end, the Presidio Trust has adopted the OASIS Sewer Maintenance software which is being implemented in FY 2006/2007. This software tracks and trends maintenance calls and inspection reports as well as issues work orders. This software is replacing the paper log book system and will enable better monitoring of the system maintenance needs. The Presidio Trust has identified the main causes of blockages in our sanitary sewer system and proposed responses have been prioritized to eliminate the causes. The Supervisor keeps a running log of the sewer spills and blockages that includes information on the root causes of the incidents. The field crew uses the root causes information to plan activities and procedures to eliminate those causes. Additionally, the Presidio Trust drafted a requirement that all commercial kitchens be equipped with grease interceptors.

The Presidio Trust has a goal of cleaning all sewer main lines once every two years. Areas needing more frequent cleaning, known as hot spots, are cleaned as frequently as once each week. The Presidio Trust has one sewer cleaning truck operating part-time with a two-man crew. When they are not operating the truck, the two workers are responsible for all sanitary sewer maintenance including the sewer pumping stations. The pumping stations are physically inspected weekly and monitored for failure or high water conditions. It should be noted that the Presidio Trust is also responsible for maintaining lateral sewer connections to all its structures.

### d. Scheduled Inspections and Condition Assessment

Requirement: Each wastewater collection system agency shall identify and prioritize structural deficiencies and implement a program of prioritized short-term and long-term actions to address them.

This section is applicable to all wastewater collection systems.

The Wastewater Collection Department's goal is to use video inspection and physical observation to inspect the main portions of the Trust system every two years. Inspections and Condition Assessments are normally conducted during the summer months when weather permits. Any time a work order or SSO occurs, a video inspection of the system in the entire surrounding area is completed. Any deficiencies found during an inspection are turned over to field crews for scheduled repairs.

### e. Contingency Equipment and Replacement Inventories

Requirement: Each wastewater collection system agency shall provide contingency equipment to handle emergencies, and spare/replacement parts intended to minimize equipment/facility downtime.

This section can be waived for collection systems that serve a population of 10,000 or less.

The Presidio Trust has a variety of equipment for emergency response including trailer-mounted pumping equipment, a vacuum truck, backhoe, and high pressure jetting equipment. The Trust also maintains an adequate supply of repair parts for emergencies. These include pipe and fittings of various sizes, pump parts, electronic components for pumping stations, cement, etc.

### f. Training

Requirement: Each wastewater collection system agency shall provide training on a regular basis for its staff in collection system operations, maintenance, and monitoring.

The Presidio Trust Wastewater Collection Department has developed a training program to ensure that its employees have the necessary skills to perform their duties in a safe and efficient manner. This training covers technical subjects as well as general and specific safety issues. Training in the wastewater profession is an ongoing process that continues throughout a specialist's entire career to keep abreast of technological and safety advances that can help make the job easier and safer. The number one priority of the Trust training program is to protect the safety of the Trust's employees and the public. This program will be reviewed on an annual basis to ensure it is meeting the safety and technical training goals of the Trust.

The courses in this program and the frequency of training are listed below

| Course | Frequency |
|---|---|
| ▪ First Aid/CPR | 2 years |
| ▪ Confined Space Entry | Annually |
| ▪ Confined Space Rescue | Annually |
| ▪ Bloodborne Pathogen | 2 years |
| ▪ Basic Electrical Safety | Annually |
| ▪ Trenching/Excavation Safety | Annually |
| ▪ Hazard Communication | Annually |
| ▪ HAZWOPR | Annually |
| ▪ Traffic Safety/Flagging | Annually |
| ▪ OSHA 510 | 2 years |
| ▪ SSO Response Procedures | 6 months |
| ▪ Lift Station Emergency Response | 6 months |
| ▪ Operation of high pressure jetting equip. | Annually |
| ▪ Customer Service | Annually |
| ▪ Storm Water Pollution Prevention | Annually |

**g. Outreach to Plumbers and Building Contractors**

Requirement: Implement an outreach program to educate commercial entities involved sewer construction or maintenance about the proper practices for preventing blockages in private laterals. This requirement can be met by participating in a region-wide outreach program.

This section can be waived for collection systems that serve a population of 10,000 or less.

. The Presidio does not contain any private laterals and manages all projects involving sewer construction and maintenance.

**7. Design and Construction Standards**

**a. Standards for Installation, Rehabilitation, and Repair**

Requirement: Each wastewater collection system agency shall identify minimum design and construction standards and specifications for the installation of new sewer systems and for the rehabilitation and repair of existing sewer systems.

This section is applicable to all wastewater collection systems.

The Presidio Trust adheres to the "Standard Plans for Public Works Construction" (The Green Book) established by the American Public Works Association (APWA) to ensure proper design and construction of sewer facilities.

### b. Standards for Inspection and Testing of New and Rehabilitated Facilities

Requirement: Each wastewater collection system agency shall identify procedures and standards for inspecting and testing the installation of new sewers, pump stations, and other appurtenances; and for rehabilitation and repair projects.

This section is applicable to all wastewater collection

The Presidio Trust adheres to the standards for testing contained in the International Plumbing Code as well as the testing guidelines set forth by the American Public Works Association.